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The impact of employment protection on FDI at different stages of economic development

Sulistiyo K. Ardiyono and Arianto A. Patunru*

Abstract

There has been much debate on how to design employment protection regulations that balance the need to attract FDI on the one hand and to protect workers' rights on the other hand. This study explores this 'dilemma', using a multi-country dataset for 2003 to 2015 and treating hiring and firing regulation and the other explanatory variables as endogenous. The findings indicate that flexible hiring and firing regulations (HFRs) is essential for FDI promotion in the early stages of economic development of a country; but the impact of labour market flexibility on FDI gradually decreases and eventually turns statistically insignificant with economic advancement. In other words, a flexible HFRs are more important for developing countries, but such flexibility does not have to be sustained in a 'race to the bottom' manner: once a country reaches higher income levels, it has more room to focus on labour standards to protect workers without compromising on the attractiveness of the country for FDI.

JEL codes: F21, J58, O24, O25

Keywords: FDI, industrial policy, labour market flexibility, economic development.

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1. Introduction

The impact of hiring and firing regulation (hereafter, HFR) on foreign direct investment (FDI) has been studied extensively, both theoretically and empirically. The theoretical studies argue that HFR is detrimental to FDI because it significantly increases the exit costs (Gorg 2002 based on Dixit 1989) and reduces firms' capability in facing demand shocks (Dewit et al. 2009; Dewit et al. 2013).

Numerous empirical studies have found significant impacts of flexible labour regulation on FDI. However, these studies have two drawbacks. First, heterogeneity among countries relating to the hypothesized association between HFR and FDI has not been satisfactorily captured because of the small number of countries covered and/or limited time coverage. For example, Dewit et al. (2009), and Delbecque et al. (2014) employ sufficiently long periods (10 years), but they only look at around 20 OECD countries. Javorcik and Spatareanau (2005) also work with OECD countries' data but use even a shorter period (less than 5 years). The limited number of observations could have prevented sufficiently capturing the heterogeneous impacts of the policy across various country groups or the effects in different time spans that may include booms and busts.

Secondly, no adequate attention has been given to possible endogeneity of the variables used. Some studies that include many countries and periods assume that labour regulation and other explanatory variables are exogenous. Without further tests and necessary treatments, this assumption potentially creates biases in the estimates. For instance, Parcon (2008) uses data from 165 countries but does not address endogeneity issues. Walsh and Yu (2010) only address endogeneity issues of growth-related variables and not on regulation variable. As far as we know, only Benassy-Quere et al. (2007) tackle endogeneity issue properly. However, their study examines a broad range of institutions, not specifically the hiring and firing regulations.

This present study utilizes a sufficiently large dataset and adequate econometric models to address the shortcomings above. The data span from 2002 to 2015, covering up to 148 countries.[1] We use difference GMM estimations to minimize the endogeneity bias and treats

[1] In some of the estimations, the inclusion of certain explanatory variables drops the number of countries covered to 118.

all explanatory variables as endogenous unless they pass the non-endogeneity test suggested by Kiviet (2020).

This paper contributes to the identification of the heterogeneous impacts of HFR on FDI accumulation in countries at different levels of income. Overall, the results show that flexible HFR is essential for FDI accumulation, providing support for the policy makers to reduce the rigidity in the labour market. However, the impact decreases or turns insignificant as the income level becomes sufficiently high. In other words, a flexible HFR is more important for developing countries, but such flexibility does not have to be achieved in a 'race to the bottom' manner (Olney 2013; Davies and Vadlammanati 2010). Countries with higher incomes can focus to create a solid industrial base or an environment that allows multinational firms to generate sufficient profits (Dewit et al. 2009, 2013) while still retain some degree of labour standards to ensure proper protection for the workers.

The remainder of this paper is organized as follows. Section 2 provides the theoretical framework and summarises the key literature on the impact of employment protection at micro- and macro levels. Section 3 explains the data and estimation strategy. Section 4 discusses the estimation results, and Section 5 concludes with some caveats.

2. Literature Review

Studies in international trade and investment have provided evidence that foreign direct investment (FDI) stimulates growth in the host countries. Borensztein et al. (1995) contend that FDI contributes more to economic growth than the host countries' domestic investment because of the superior technology it comes with. Such technologically-driven growth is necessary to create jobs (Javorcik, 2012), reduce poverty (Klein et al., 2001), and transform the economy of the host countries (Lipsey, 2001). However, it is rarely the case that FDI flows from advanced countries to less developed countries to help the latter grow (Ohanian and Wright, 2010). Often, FDI tries to exploit the potential market size in developing countries (Knickerbcker, 1973; Vernon, 1982; Narciso, 2010), although Backus et al. (2014) argue that, other factors such as productivity and tax rate also play a significant role.

Some studies have investigated the determinant of FDI in the attempt to improve the strategy to attract FDI. De Mello (1997) classifies the determinants into three categories: market size, factor costs, and other factors. Market size refers to the income level (GDP per capita) or the population's number, while factor costs include payments to labour and capital. The 'other' category broadly covers macroeconomic environment such as trade openness and

institutional variables. Wheeler and Mody (1992), Head et al. (1995), and Kinoshita and Mody (1992), and Campos and Kinoshita (2003) find that the decision of FDI location is driven not only by factor endowments such as natural and labour resources but also by the utilization of economies of scale and agglomeration.

Multinational firms always try to minimize costs and maximize revenue. Hence, they would favour a host country that offers enormous market opportunity, low production cost, and less entry and exit barriers. When the market size and resources endowments are given, countries with competitive factor cost and conducive investment climate are preferable. Consequently, governments in many countries try to remove barriers to investment and make their regulations more flexible, leading to a 'race to the bottom' where they compete in scrapping as many regulations as possible, often leaving very limited protection to domestic wokers (Olney, 2010; Davies and Vadlamannati, 2013). This has triggered a debate that regulations that are too flexible might potentially harm the labour force and negate the objective of attracting FDI to create jobs, wealth, and wellbeing (OECD, 2013).

Concerning profit optimization, firms value flexible environment that allows them to adapt well to demand shocks. Dewit et al. (2013) argue that hiring and firing regulation (HFR) is an essential factor that affects a firm's adaptability in response to demand changes. In a host country, where HFR is flexible, firms can quickly increase the number of workers or working hours when demands increase, and they can lay them off when demand decreases without incurring high costs to pay the compensation, such as severance payment. Firms in a host country where HFR is rigid do not have this flexibility.

Some empirical studies find that less strict employment protections tend to increase employee turnover as firms try to adjust to demand shocks by hiring and firing. A study by Kugler (1999, 2004) using Columbian data concludes that the lower severance payment regulation increases the likelihood of transitioning from unemployment to employment and vice versa. Meanwhile, Davied et al. (2018) argue that flexibility in employment protection increases the labour market's responsiveness to growth. Freeman (2010) and Duval and Loungani (2018) argue that a restrictive labour regulation creates distortion that hinders efficient allocation of resources and so creates an adverse impact on productivity.

Other empirical studies using firm-level data generally find positive impact of HFR on FDI inflows. Using data from 19 countries in Western and Eastern Europe, Javorcik and Spatarenau (2005) find that flexible HFR positively affects FDI inflows, especially in services industries. Using French firm-level data, Delbecque et al. (2014) conclude that stringent labour market regulation and generous unemployment benefits policies in host countries reduce the

probability of firms locating in the country. However, they also note that although labour regulation is essential in investment location, it is less important than other factors such as market potential and supply access. A corporate finance study by Alimov (2015) suggests a mechanism where FDI flows to countries with strict labour regulation through the adverse effect of employment regulation on asset prices. He shows that the increase of country-level employment protection alters high-skilled firms' value, attracting foreign entities. In this way, although the labour regulation decreases the local firms' value, it still attracts FDI inflows.

The studies using firm-level data usually assume that labour regulation is exogenous, while country-level studies address endogeneity issues in different ways. Gorg (2005) uses gravity model, but without endogeneity concern, to study the impact of exit costs on the US outward FDI in 33 host countries during 1986-1996. He concludes that the attractiveness of FDI is related to the incentive to entry, such as tax rate and exit cost that he estimates using the hiring and firing index. Benassy-Querre et al. (2007) come to the same conclusion after comparing their results with- and without GDP. Parcon (2008) finds that labour regulation affects FDI inflows positively through the cost channel but negatively through the productivity channel. An interesting feature in Parcon (2008) is the inclusion of the squared term of labour market regulation that leads to the finding that the impact of labour market regulation is non-linear. However, he does not discuss the endogeneity problem in his paper.

Several macro-level studies tackle the endogeneity issues by using GMM, but the number of countries covered is limited. Developing the work of Gorg (2005), Dewit et al. (2009) utilize the outward FDI data of OECD countries from 1986-1995. Their findings are nuanced. While they find a negative impact of rigid HFR on FDI, they also discover that some foreign firms opt to stay in developed countries with stringent HFR. Consequently, developing countries should pursue a flexible labour regulation while developed countries with a strong industrial base can sustain the relatively high cost of hiring and firing regulations. Another work that deals with endogeneity issues is Walsh and Yu (2010). They implement the Arellano-Bond GMM approach using data from 27 developing and developed countries. Their result supports flexible labour regulation in attracting FDI. Again, their study's drawback is the limited number of countries included and the fact that they apply endogeneity treatment only to growth-related variables and not to the institutional variables.

Although most studies support flexible employment protection policy, some find evidence to support more stringent employment protection. Wasmer (2006) suggests that a higher degree of employment protection provides incentives for firms to invest in human capital, especially in more advanced industries. Acharya et al. (2013) reach a similar conclusion

that a stringent dismissal law can be beneficial for innovation-intensive industries. Griffith and Macartney (2014) suggest that employment protection does not impact innovation projects carried out by multinational firms and, in fact, increases their patent records. However, multinational firms tend to relocate their innovation centre in risky projects to countries with low employment protection regulations. They suggest that the degree of employment protection should be tailored to different macroeconomic environments.

3. Theoretical Framework

This study applies the theoretical framework introduced by Dewit et al. (2009) that examines how employment protection affect FDI flows under uncertainties. In addition to the fixed cost and the marginal cost, employment protections affect firms' decisions in choosing their initial location, level of output, and relocation.

We lay out the model as follows (Appendix 1 shows the full exposition). It assumes a monopolist firm with options in period 1 to choose the initial location (home or foreign country) and determine the optimal output.[2] In period 2, the firm has to choose whether to continue producing in the home country or moving to a foreign country and deciding the optimal output level. In both periods, the firm considers the fixed cost of setting up a plant or the cost of relocation, the marginal cost of production, and the level of employment protection. Other factors are assumed to be similar in the home- and in the foreign country for simplicity.

In period 1, the firm will choose the home country if its expected profit is higher than that in the foreign country and vice versa:

$$\pi_1^i = (p_1 - c^i)q_1^i - \emptyset^i \quad (1)$$

where π_1 is the profit in period 1; $p_1$is the price in period 1 defined as $p_1 = a - bq_1$; c is the marginal cost of production; $q_1$is the optimal output in period 1; $\emptyset^i$is the fixed cost in setting up a plant and FDI cost if the firm locates in the foreign country; i denotes the investment location, $i = (h = home, f = foreign)$.

The model assumes that the home country's level of employment protection is stricter than that of the foreign country $\lambda^h > \lambda^f$ and for simplicity $\lambda^f = 0$. The employment protection

[2] The model using oligopoly fims can be found in Dewit et al. (2013) that model the behaviour of firms under Cournot and Bertand competition. For simplicity, this paper uses Dewit et al. (2009) with assumption that multinational firms are usually relatively big in size with distinct product.

affects the level of optimal output the firm produces, which is obtained by setting $\partial E\pi(i_1)/\partial q_1^i = 0$.[3]

$$q_1^h = \frac{a - c^h - (1-\rho)\lambda^h - I\rho\lambda^h}{2b} \quad (2)$$

$$q_1^f = \frac{(a - c^f)}{2b} \quad (3)$$

The decision of optimal output in period 1 is made considering the probability of the demand in period 2 with alternatives such as in equation (4) and (5).[4] There is a probability ρ that the demand in period 2 would be the same as the demand in period 1, i.e., $p_2 = a - bq_2$, and the probability $(1-\rho)$ that it would be higher, i.e., $p_2 = a - bq_2 + \varepsilon$; I is an indicator variable where $I = 1$ if $q_1^h > q_2^h$ and $I = 0$ otherwise; ε is a positive demand shock.

If the firm decides to locate in the home country, some conditions must be satisfied, as shown by equations (1), (2), and (3) (see Appendix 1 for the full exposition). First, the fixed cost in setting up a plant in the home country is lower. Second, the home country's employment protection is more flexible, so it would not cause an extra cost when the demand declines. In response to a drop in demand, a firm usually reduces the number of workers employed, and it might be costly under a strict employment protection regime (see Equation 6, 7, and 9 in Appendix 1).

In period two, the firm faces the alternatives to stay in the home country or relocate to a foreign country. The decision also considers the marginal cost of production, the relocation cost, and the employment protection in both countries (see equation (4) and (5) and Appendix 1 for the full derivation).

$$\pi_2(h_1, f_2) = \left(p_2 - c^f\right)q_2^f - \lambda^h q_1^h - \emptyset^f \quad (4)$$

$$\pi_2(h_1, h_2) = \left(p_2 - c^h\right)q_2^h - I\lambda^h(q_1^h - q_2^h) \quad (5)$$

where $\pi_2(h_1, f_2)$ refers to the condition when the firm chooses the home country as the production location in period 1 and then relocates to the foreign country in period 2. When the firm chooses to stay in the home country in period 2, equation (5) applies.

Assuming that the marginal cost of production in a foreign country is lower, $c^f < c^h$, the firm's probability of relocating will be higher if the positive demand shock is higher. In other words, if the firm expects a significant increase in the demand, it will relocate to the

[3] The optimal output in period 1 considers the expected optimal output in period 2 that incorporates the employment protection flexibility. See Appendix 1.

[4] The full exposition starts with deriving the optimal output in period 2.

foreign country because the revenue should be sufficient to cover the relocation cost ($\emptyset^f$). As $\left(q_1^h - q_2^h\right)$ becomes higher, the profit $\pi_2(h_1, h_2)$ will be smaller. The relocation cost includes setting up a new plant in the foreign country and closing down the home country's facilities. In some circumstances, the firm will stay in the home country if the expected revenue is less than the relocation cost. The optimal decision requires a calculation of the optimal output in period two, both in the home and the foreign country, as can be seen in Appendix 1.

When the FDI cost is considerably low, the probability of relocating to a foreign country with lower marginal cost and more flexible employment protection is higher. The price of closing down the old plant includes the redundancy cost related to the employment protection. So, rigid employment protection in the home country potentially anchors the firm to stay at home, especially when the cost of severance payment and setting up the new plant in the foreign country exceed the expected return. Therefore, given that the home country's employment protection is high, the firm has to decide where to set up its plant in period one.

Dewit et al. (2012) develop the model by expanding the marginal cost of production into labour and capital costs to capture the impact of employment protection on industry-specific FDI. The result suggests that the effects of employment protection on different industry-specific FDIs are complex. However, they find that stricter employment protection potentially slows down the exit of the relatively big, labour-intensive firms. Dewit et al. (2013) extend the analysis to include oligopolists that behave under a Cournot- and a Bertrand competition. The result is ambiguous. Under a quantity-based Cournot competition, when a firm decides the number of output based on the decision made by its competitor, the domestic anchorage holds if the size of the market is enormous. However, under a Bertrand competition where firms compete on prices,, a country with flexible employment protection is favorable. Such an ambiguous effect is also evident in the study by Parcon (2008), who extends Dewit et al. (2003). Parcon (2008) finds that the impact is positive through the cost channel but negative through the productivity channel.

This study follows Dewit et al. (2009) because their model is simple and more suitable for aggregate data and fits the study's main objective to examine the impact of employment protection on FDI across income levels. Granted, there is a probability that the effect of employment protection across the income level is also ambiguous.

4. Methodology

To estimate the impact of employment protection, we focus on hiring and firing because this component affects the firms' flexibility to respond to demand shock, as discussed above. In addition, the measurement of this sub-index of Fraser Index is less problematic as pointed out by Aleksynska (2014). We assemble a panel data of 148 countries from 2003 to 2015 and we employ the generalized method of moment (GMM) technique introduced by Arrelano and Bond (1991) with the command written by Roodman (2009b). Considering that GMM has a potential issue of weak instrumental variables (Roodman 2009a), we follow Kiviet (2020) to choose the most appropriate model for estimation (see Appendix 2 for the complete procedure). We also use Kripfganz (2020) to calculate the information criteria to help determine the most appropriate model.

While our framework closely follows Dewit et al. (2009), we also consider Campos and Kinoshita (2003), who argue that FDI is persistent because of agglomeration effect. This can be captured using lagged dependent variables. Based on Cheng and Kwan (2000), the relationship thus becomes:

$$\Delta fdi_{it} = \alpha(fdi_{it}^{*} - fdi_{it-1}) \tag{6}$$

where $\Delta fdi = fdi_{it} - fdi_{it-1}$ and subscript i and t refer to, respectively, country and time. The term fdi_{it}^{*} refers to the equilibrium or steady state level of FDI stock. Rearranging them produces:

$$fdi_{it} = (1-\alpha)fdi_{it-1} + \alpha fdi_{it}{}^{*} \tag{7}$$

The steady-state level of FDI, $fdi_{it}{}^{*}$, is determined by X_{it}, a vector of economic, policy, and institutional variables as well as country-specific and time-specific factors. The firm's location decision is influenced by employment protection policy and other factors affecting the revenues and costs. De Mello (1997), Wheeler and Mody (1992), Head et al. (1995), Kinoshita and Mody (1992), and Campos and Kinoshita (2003) discuss and classify these factors into different categories as noted in the literature review. Putting them together yields equation (8) with hf_{it} represents the HFR index, v_{it} is country-specific error, and η_t is time-specific error.

$$fdi_{it}{}^{*} = \gamma hf_{it} + \lambda X_{it} + v_{it} + \eta_t \tag{8}$$

The interest here is to examine the impact of employment protection regulation on FDI at different stages of the economy, which is captured by the interaction of hiring and firing regulation, hf_{it}, and the stage of economic development represented by GDP per capita in logarithmic form, $lgdp_{it}$. To minimize the bias from variable omission, we also include the

square of HFR index denoted as hf_{it}^2, the interaction of HFR with the GDP per capita, $hflgdp_{i,t}$, and the square of GDP per capita, $lgdp_{it}^2$. Parcon (2008) also includes the squared term of labour market regulation, arguing based on Dewit (2003) that labour market regulation potentially reduces the marginal cost of production and enhances labour productivity. At the same time, it also increases the firms' total variable costs. Meanwhile, the interaction of HFR with GDP per capita is to test whether or not the pattern is linear with respect to the stages of development. The inclusion of the squared term of GDP per capita is to capture the possibility that the effect of GDP per capita on FDI is not linear.

The combination of equation (7), equation (8), and the inclusion of the other variables in addition to the explanatory variables, X_{it}, yields equation (9).

$$fdi_{i,t} = \beta_0 + \delta fdi_{i,t-1} + \beta_1 hf_{i,t} + \beta_2 hf_{it}^2 + \beta_3 hflgdp_{i,t} + \beta_4 lgdp_{it} + \beta_5 lgdp_{it}^2 + \beta_6 X_{i,t} + v_i + \eta_t + \mu_{i,t} \quad (9)$$

where $\delta = 1 - \alpha$; $\beta_1 = \alpha\lambda$; $\beta_6 = \alpha\lambda$;

The term $\mu_{i,t}$ captures the idiosyncratic error. The year is included as a time dummy to satisfy the assumption that no correlation across individuals in the idiosyncratic disturbances (Roodman, 2009b).

To get an adequate model specification with consistent and efficient estimates, Kiviet (2020) suggests some critical steps in applying GMM. This includes: (i) adding one or more lags of the explanatory- and lagged dependent variables to capture the dynamic relationship among variables and to eliminate the serial correlation in error; ii) classifying all regressors as endogenous unless they pass the examination to include them as exogenous or predetermined variables. Thus, equation (9) turns into equation (10) below. For simplicity, the main interest variables (*hf, hf², hflgdp, lgdp lgdp²*) and other explanatory variables are represented as $x_{i,t-l}$.

$$fdi_{i,t} = \sum_{l=1}^{p_0} \delta_l \, fdi_{i,t-l} + \sum_{m=1}^{M} \sum_{l=0}^{p_m} \beta_l^{(m)} \, x_{i,t-l}^{(m)} + \sum_{s=2}^{T} \tau_s \, d_{i,t}^{(s)} + \eta_i + \varepsilon_{i,t} \quad (10)$$

where η_i is individual country effect; and $\varepsilon_{i,t}$ is idiosyncratic errors. The regressors are i) lagged dependent variable with p_0 denotes the lags of the dependent variable with $p_0 \geq 1$; ii) other explanatory variables $x_{i,t}^{(m)}$ with p_m denoted the lags of *M* distinct variable and $p_m \geq 0$; *M* is the number of other explanatory variables; and iii) time dummies variables $d_{i,t}^{(s)}$ where $d_{i,t}^{(s)} = 1$ for *t* = *s* and zero otherwise.

Kiviet (2020) shows that the instrumental variables in GMM are valid if they are uncorrelated with $\eta_i + \varepsilon_{i,t}$. One of the ways to eliminate part of the disturbance is by applying the difference GMM. Denoting $\Delta fdi_{i,t} = fdi_{i,t} - fdi_{i,t-1}$, the first-difference model of equation (10) is

$$\Delta fdi_{i,t} = \sum_{l=1}^{p_0} \delta_l \, \Delta fdi_{i,t-1} + \sum_{m=1}^{M} \sum_{l=0}^{p_m} \beta_l^{(m)} \, \Delta x_{i,t-l}^{(m)} + \sum_{s=2}^{T} \tau_s \, \Delta d_{i,t}^{(s)} + \Delta \varepsilon_{i,t} \tag{11}$$

Concerning the random disturbance in equation (11), $\Delta\varepsilon_{i,t}$, the moment conditions of the regressors, either lagged dependent variable and the explanatory variables, can be classified as endogenous, predetermined, or exogenous for these conditions below:

$E\left(fdi_{i,t}\Delta\varepsilon_{i,t}\right) = 0$ for $s \leq t\text{-}2$

$E\left(x_{i,s}^{(m)}\Delta\varepsilon_{i,t}\right) = 0$ for $s \leq t\text{-}2$ if $x_{i,t}^{(m)}$ is endogenous with respect to $\varepsilon_{i,t}$

$E\left(x_{i,s}^{(m)}\Delta\varepsilon_{i,t}\right) = 0$ for $s \leq t\text{-}1$ if $x_{i,t}^{(m)}$ is predetermined with respect to $\varepsilon_{i,t}$

$E\left(x_{i,s}^{(m)}\Delta\varepsilon_{i,t}\right) = 0$ for $\forall_s$ if $x_{i,t}^{(m)}$ is exogenous with respect to $\varepsilon_{i,t}$

We discuss the implementation steps in Appendix 2. Briefly, it considers: (i) using a sufficient number of lag for the explanatory variables; (ii) testing the endogeneity of the explanatory variables; and (iii) testing whether system GMM is applicable for the estimation. Regarding the use of lags, Kiviet (2020) recommends lagging the variables twice. However, in this study, the first lag is sufficient to capture the dynamic adjustment because the FDI data is persistent. Therefore, we report the result based on the model that incorporates lag 1 of the explanatory variable—this is our main model.

5. Data

This study employs a panel data of 148 countries from 2003 to 2015 comprising of 1,368 observations for the basic model.[5] The number of countries included decreases, as different control variables are added into the model with the minimum number of countries is 118 when the real internal rate of return (IRR) is included as a control variable. Table 1 shows the variable definition and the data source, while the descriptive statistics can be found in Appendix 3.

[5] The basic model refers to the model that does not include additional explanatory variables in addition to the lagged dependent variable, *hf, hf², hflgdp, lgdp* and *lgdp²*.

Table 1. Variables Included

Variable	Measurement in equation	Sources
1. Stock of inward FDI per capita	Log of FDI stock in Million USD divided by the number of population from United Nations Population Division (ln)	UNCTAD UN Population Division
2. Hiring and firing flexibility	Index constructed based on Global competitiveness report question: the hiring and firing are impeded by regulation (score 1) or determined by employers (score 7).	Fraser Institute
3. Stages of economic development	Log of GDP per capita (PPP) in constant 2011 international $ (ln)	World Bank
4. Control variables		
▪ Labour force	People aged 15 and older who supply labour for the production of goods and services during a specified period as the percentage of the total population (% of the population)	World Bank
▪ Working-age population	Peoples aged 15-64 as the percentage of total population (% of the population)	World Bank
▪ Trade openness	Sum of exports and imports of goods and services measured as a share of gross domestic product (% of GDP)	World Bank
▪ Human capital	Mean years of schooling	Global Education
▪ Natural resources	Total export of resources-based product per capita under three-digit SITC defined by The World Bank (ln of USD million per capita).	Author estimation based on WITS data and definition
▪ Corporate tax	The statutory corporate income tax rate (%)	Tax foundation
▪ Real internal rate of return	The required rate of return on capital calculated based on Jorgenson & Nishimizu (1978) as income flowing to capital in terms of nominal GDP minus labour income, minus natural resource rents, measured in %	Penn World Table
▪ Financial market depth	Index constructed by IMF based on stock market capitalization to GDP, stock traded to GDP, international debt securities of government to GDP, and total debt securities of financial and non-financial corporations to GDP	IMF

Main interest: FDI, employment protection, and stages of economic development

The dependent variable is inward FDI stock per capita, and the main independent variables are HFR and its interaction terms with GDP. We divide the inward FDI values collected from UNCTAD by country's population from UNDP. The use of stocks instead of flows data follows Lane and Milessi-Ferreti (2002), who show that using stock data reduces fluctuation noise. On the right side, the key variables are employment protection and development stages that are respectively represented by the hiring and firing regulation (HFR) index from Fraser Institute and GDP per capita (PPP) from World Bank Development Indicator databases. Their interaction is also included to minimize the bias from variable omission and to capture the relationship between HFR and the country's income level. Furthermore, to examine whether the regulation's impact is linear or non-linear, their squared terms are also included.

The Fraser's hiring and firing index is a sub-component of labour market regulation that constitutes the regulation pillar in Fraser Institute's Economic Freedom Index. The Economic Freedom Index comprises five pillars or areas: (i) size of government, (ii) legal system and property rights, (iii) sound money, (iv) freedom to trade internationally, and (v) regulation. The regulation area consists of three different components: credit market, labour market, and business regulation. The labour market regulation itself is presented as an index calculated by averaging six subcomponents: (i) hiring regulation and minimum wage, (ii) hiring and firing regulation, (iii) centralized collective bargaining, (iv) hours regulations, (v) mandated cost of worker dismissal, and (vi) conscription.

Aleksynska and Cazes (2014) show that Fraser's labour market regulation index has a drawback in data measurement. In many countries, some components' data are not available, and hence the averaging method to calculate the index is inconsistent across countries. They also point out that the measurement in some sub-components of the labour market, such as minimum wages, mandated cost of hiring, and worker dismissal cost, involved changes in some years.[6] The inconsistencies trigger a lot of criticisms that led to a suspension of the publication. Aleksynska and Cazes (2014) also highlight that in 2010 Fraser introduced changes in its methodology and revised some data, but the data before 2002 was left unrevised. In another paper, Aleksynska (2014) states that *hiring and firing regulations* and *conscriptions* are less problematic than the other subcomponents.

[6] These component are collected from World Bank Employing Worker Index (EWI).

Therefore, this study does not use the labour market index but instead only uses its subcomponent, i.e. hiring and firing regulation. This HFR measure is based on the Global Competitiveness Report that questions whether the hiring and firing is impeded by regulation (score 1) or flexibly determined by employers (score 7) (Gwartney et al. 2019). This study does not use conscriptions in the models because it's not applicable in most countries, and it's beyond the interest of this study.

Control variables

The additional control variables included in this study are those representing different motives in FDI. We follow De Mello (1997) who classified FDI determinants into three categories: market size, factor cost, and other types. The market size is usually represented by GDP per capita, which is incorporated in this study as the main variable of interest. We use appropriate variables to proxy the factor cost and another category considering their representativeness and their data availability. We do not include the control variables whose data are not available in at least 120 countries throughout observation except for the real internal rate of return (IRR) that is only available for 118 countries. The inclusion of IRR in this study is necessary to control the risk premium or cost of capital which is a crucial factor in investments.

The factor-cost determinants are variables related to labour, capital, and natural resources. To measure the labour contribution, we include the labour force data: the number of people aged 15 and older who have been involved in the production of goods and services, measured as a percentage of the total population. The alternative measure is the working-age population representing the people aged 15-64 as the percentage of the population. Both data are collected from the World Bank Development Indicator. FDIs in high skilled industries likely require more qualified human capital, so we also use the country's average years of schooling data from Roser and Ortiz-Ospina (2016) as a control variable. Finally, we use the real IRR from the Penn World Table as a proxy for capital cost.

We expect positive signs from all labour-related indicators and a negative sign for the cost of capital. A higher labour force and working-age population are expected to increase FDI stock as more productive labour is used in the economy to increase domestic production. The impact of the demographic factor on investment flow and economic growth has been studied extensively, such as by Feldstein and Horioka (1980), Higgins (1998), Mason (2005), and Mason and Kinugasa (2008). On the other hand, human capital quality is also expected to positively affect the stock of FDI, as studied by Noorbakhsh et al. (2001) or Faria and Mauro

(2009) as part of institution quality. On the contrary, the sign for IRR is expected to be negative. A high IRR implies a high investment cost that might prevent the flow of capital or well-known as the Lucas Paradox (Lucas, 1990) although other factors outside the capital cost potentially explain the capital immobility (Prasad et al., 2007).

To measure the resources-seeking motive, we aggregate the export values of resources products in each country based on the World Integrated Trade Solution (WITS) classification.[7] We divide the aggregate value by the total population of each country from UNDP data and then transform it into its natural logarithmic form. The expected sign of the natural resources is ambiguous. According to the Rybczynski theorem, a boom in natural resources leads to reallocation of resources from other sectors, so when a country experiences a boom in natural resources industries, FDI to the other sectors may decline depending on the country's sector compositions and the degree of capital mobility (Corden and Neary, 1982).

The third group of control variables is macroeconomic environment or institutions indicators such as trade openness, statutory corporate income tax, and financial market depth (FMD). Trade openness measures the country's connectedness to the rest of the world based on the share of import and export in GDP. The data is collected from the World Development Indicator, World Bank. We expect the sign for this variable to be positive as an internationally open economy will attract more capital, and simultaneously, higher capital leads to a higher degree of trade openness. The corporate tax variable collected from the Tax Foundation measures the statutory corporate income tax in percentage. The sign of corporate tax is expected to be negative as higher tax means higher cost for the MNE to operate unless they only want to exploit the host countries' market. The IMF constructs the financial market depth index by compiling the data on stock market capitalization to GDP, the stock traded to GDP, international debt securities of government to GDP, and total debt securities of financial and non-financial corporations to GDP (see Sviridzenka, 2016). The expected sign of the estimate is positive because capital deepening facilitates capital accumulation (Sahay et al., 2015).

[7] It covers 57 product group in 3 digit SITC.

FDI and HFR: a first look

This section examines the patterns of FDI stocks and HFR across countries throughout observations.[8] Figure 1 shows that the level and trend are easily distinguishable by development stages as higher-income countries have higher FDI stock.[9] The trend is common, from 2002 to 2007 among high-income countries and up to 2008 among the non-high-income countries before falling gradually in the aftermath of the global financial crises (GFC).

Figure 1. FDI stock per capita

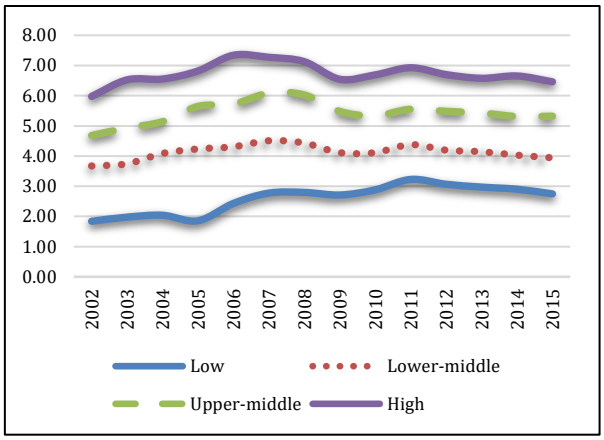
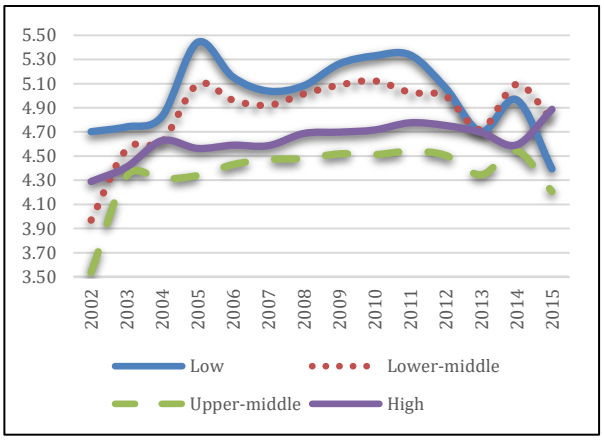


Figure 2. Hiring and firing index



The HFR pattern is less clear (Figure 2). The upper-middle countries, on average, seem to have less flexible labour market regulation over time. On the other hand, high-income countries, especially the OECD countries, have carried out major labour regulation reforms in the aftermath of GFC to respond to lower dualism stagnation in the labour market (OECD, 2020). As a result, at the end of the observation in 2015, high-income countries have the most flexible regulation on average.

One important thing to note is the hiring and firing irregularity in 2002. The average regulation index is very low for lower-middle and upper-middle countries before increasing sharply in 2003. Although Aleksynska and Cazes (2014) assert that the Fraser's HFR index is less problematic in representing the labour market, there is a possibility that the measurement change carried out by Fraser might affect the data in 2002. For this reason, we use the data from 2003 to 2015 to estimate the impact of hiring and firing regulation to minimize the irregularity impact on the estimation.

[8] The number shows the simple average of FDI stock and HFR index of the countries within the same group.
[9] The stages of development refer to the historical classification by income used by World Bank accessed from https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Figure 3. Hiring-firing index and FDI stocks

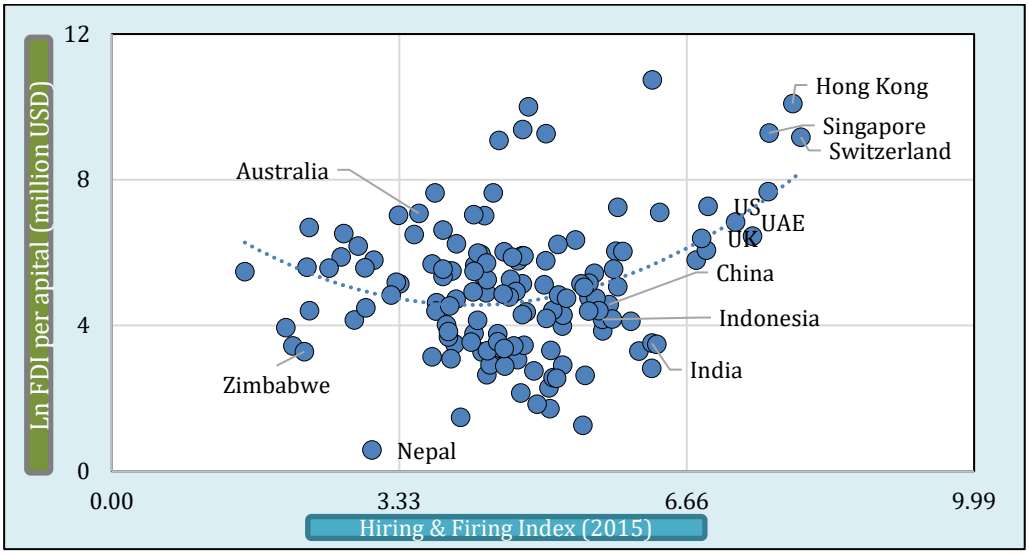
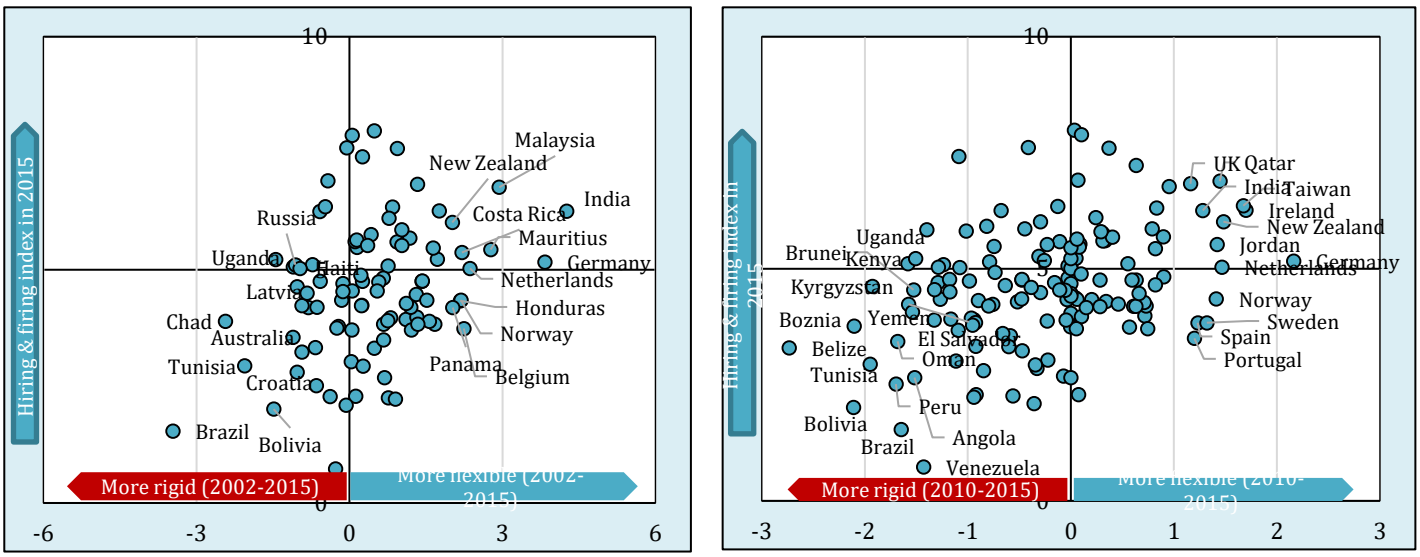


Figure 3 shows that the HFR index and FDI stock have a relationship that resembles a U-shaped pattern. The middle-right and top-right panel representing high FDI stock and flexible HFR are occupied by global financial hubs such as Hong Kong, Singapore, Switzerland, United States, United Arab Emirates, and the United Kingdom.

Figure 4 shows the changes in HFR in two different periods, with countries divided between those whose HFR had become more rigid and those whose HFR had become more flexible. From 2002 to 2015, more countries had made their HFR more flexible, but the opposite is true for the period 2010-2015.[10] Labour market reforms (i.e., those that make HFR more flexible) were dominated by developed countries, with very significant changes made by Germany (more than two index increases). On the other hand, the more rigid HFR were enforced by countries from Latin America and Africa. The rigidities of labour market regulation in Latin America have been discussed, for example, by David et al. (2019).

[10] The progress is calculated by subtracting the index in 2015 by that in 2000 for each country.

Figure 4. The changes in the hiring and firing index
during 2002-2015 (left panel) and during 2010-2015 (right panel)



Different studies in labour market reform, such as that by Kuddo (2018), who cited Ease of Doing Business (2018), reports that during 2007 and 2017, almost half of 99 countries have made their labour regulation more flexible while the others have done the opposite. Their conclusion is based on the indicator such as fixed-term contract, redundancy procedures, severance pay, and advance notice requirements.

As the index is qualitative with relative measurements, the interpretation is not straightforward. Therefore, the country's index should be compared to those of other countries in the same year or to its own historical record across time. A similar interpretation is used by Karabegović (2004) when examining the flexibility of labour relations laws in Canada and the United States.

To illustrate, Figure 5 compares HFR index in three developing countries in Southeast Asia: Indonesia, the Philippines, and Vietnam. For cross-country comparison, one index difference is apparent from the Philippines and Vietnam during 2010-2013. During the period, the Philippines' average hiring and firing index are just below 4, while Vietnam’s figure is around 5. Meanwhile, one index difference in the same country is observable for Indonesia from 2002 to 2005 when the average index is 4.6 and 2006-2015 when the corresponding number is 5.6. Figure 6 shows the FDI trend in three countries with strong positive growth in

Vietnam, a slowing down in the recent years in Indonesia, and steady growth in The Philippines.

Figure 5. Hiring and firing index in 3 developing countries in Southeast Asia

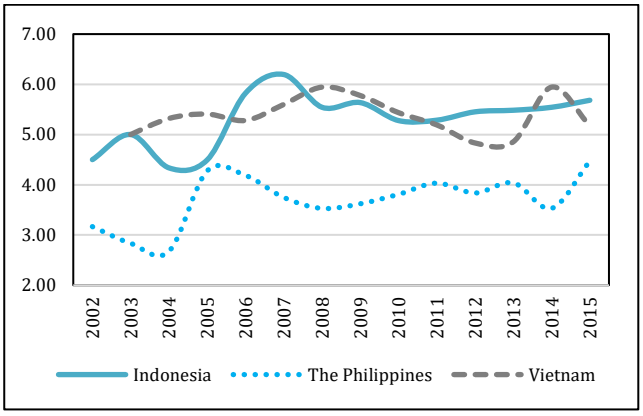
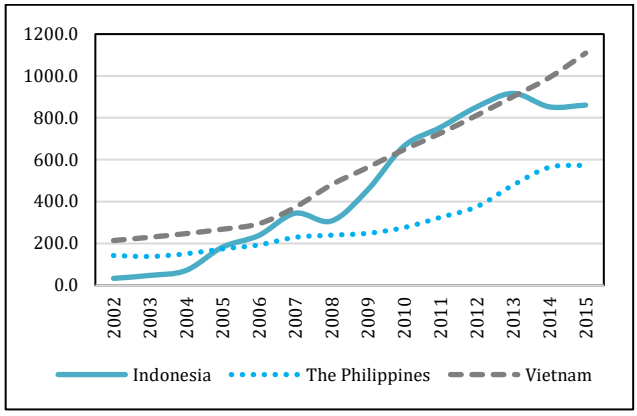


Figure 6. Inward FDI stock (USD per capita) in 3 developing countries in Southeast Asia



Although the index is calculated based on the perception of the firms' manager surveyed, it represents the law and the implementation of HFR in the respective countries. For illustration, Appendix 4 highlights the firing regulation, especially contract termination, notice period, and severance payment in Indonesia, the Philippines, and Vietnam. In general, Vietnam has the most flexible firing regulation. Vietnam's average index of HFR during 2010-2015 is 5.37, or slightly higher than that of Indonesia at 5.30 but significantly higher than that of the Philippines, whose average index is 3.70. In line with the index, the Philippines' firing regulation is the most rigid among the three countries.[11]

6. Results

This section discusses the main results, the heterogeneous impact simulations of HFR across different income levels, and some robustness tests. All estimations were conducted using difference GMM.[12]

[11] The description might not be perfectly aligned with the index here because the description is written in 2018 for Indonesia and Philippines and 2016 for Vietnam.

[12] The system GMM is not applicable for estimation in this study. There is at least one set level instrument in each model which is not exogenous (the difference Hansen p-value < 0.3 as suggested by Kiviet (2020). The test result is available in Appendix 9.

6.1. Main models, 2003-2015

The discussion starts with a simple model without additional control variable (the basic models) and an assumption that HFR is endogenous. Following Kiviet (2020), we impose sufficient GMM instruments for each independent variable.[13] If the endogenous model satisfies the GMM criteria, we then treat HFR as exogenous and test the validity of that assumption.[14] To see the impact of HFR in different situations, we add control variables one by one. The main models use a full specification, which includes the squared term of HFR (hf^2) and the squared term of GDP per capita ($lgdp^2$) in addition to the key variables: hiring and firing regulation or HFR (hf), GDP per capita in log form ($lgdp$), and their interaction term ($hflgdp$). The results presented here satisfy the validity of GMM instruments as suggested by Kiviet (2020).[15]

The basic model (Table 2 column (1)) shows that HFR significantly affects the FDI accumulation, and the impact is heterogeneous across income levels. The HFR coefficient is significant at 10% level, while the joint test between HFR and its interaction with GDP per capita (HFLGDP) is significant at 1% level. The cumulative marginal effect of HFR is positive while that of HFLGDP is negative, suggesting a non-linear effect of the regulation across income levels. The basic model gives evidence that HFR positively impacts FDI accumulation and the impact decreases as the country's income level increases. This finding is consistent with, for example, Acharya et al. (2013) and Griffith and Macartney (2014), who find that rigid employment protection does not affect high skilled industries that predominantly exist in high-income countries.

When different control variables are added, HFR coefficients are still positive and significant except in one model that controls for internal rates of return (IRR). There are some possible explanations for this. First, model (8) could have a finite sample bias due to IRR data availability that forced the observation to decrease to 118 countries, lower than the average observation in other models in the range of 143 to 148 countries. Second, the impact of HFR could be ambiguous if other factors affect FDI cost structure, as suggested by Dewit et al. (2009). Third, there might be better specifications to model the impact of HFR when IRR is controlled for. In the robustness test section (see below), we compare the result with those using two different specifications: (i) excluding hf^2 from the equation, (ii) excluding hf^2 and

[13] We instrument the endogenous variable using their lag(2 5) or lag(2 3) or lag(2 6) to satisfy the GMM criteria based on Kiviet (2020).
[14] In most cases, the exogenous assumption is not valid.
[15] The GMM criteria includes: i) the instrument are jointly exogenous (overall Hansen p-value > 0.2); ii) No remaining serial correlation in the error term (AR2 p-value > 0.2, AR1 < 0.05); iii) Incremental Hansen p-value of all instrument subset > 0.2.

$lgdp^2$ from the equation. Specification (i) is the preferred model based on information criteria, and it gives a significant estimate for HFR. So, we conclude that there is sufficient evidence of the positive impact of HFR on FDI accumulation.

Table 2. The impact of hiring and firing regulation (HFR) on FDI under the endogenous assumption on HFR

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L1 of stock FDI	0.77***	0.92***	0.76***	0.76***	0.86***	0.75***	0.77***	0.98***	0.77***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HFR index	0.75*	0.51*	0.79*	1.03**	1.84***	0.76**	2.06**	0.67	0.64*
	(0.08)	(0.09)	(0.05)	(0.02)	(0.00)	(0.01)	(0.02)	(0.27)	(0.05)
L1 of HFR index			-0.09**	-0.06*				-0.08	
			(0.02)	(0.05)				(0.13)	
Squared HFR index (HFR^2)	-0.01	-0.00	-0.01	-0.02	-0.08**	-0.00	-0.08**	-0.01	0.01
	(0.63)	(0.97)	(0.43)	(0.19)	(0.01)	(0.95)	(0.02)	(0.68)	(0.57)
L1. Squared HFR index (HFR^2)		-0.01**				-0.01**			-0.01**
		(0.01)				(0.04)			(0.01)
HFR index * GDP/capita (HFLGDP)	-0.06	-0.04	-0.06*	-0.09**	-0.12***	-0.08**	-0.14*	-0.06	-0.07**
	(0.11)	(0.18)	(0.08)	(0.02)	(0.01)	(0.01)	(0.07)	(0.30)	(0.02)
L1 of HFR index * GDP/capita (HFLGDP)	-0.01***								
	(0.00)								
GDP per capita	5.37***	3.76**	6.29***	7.70***	4.20***	4.04***	4.03**	8.21**	4.69***
	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.04)	(0.01)
L1 of GDP per capita				-1.77*					
				(0.10)					
Squared GDP per capita ($LGDP^2$)	-0.25**	-0.16*	-0.30**	-0.30**	-0.19***	-0.18***	-0.16	-0.47*	-0.22**
	(0.03)	(0.09)	(0.01)	(0.02)	(0.00)	(0.00)	(0.14)	(0.06)	(0.03)
Control variable	Basic	Trade openness	Labor force	Working age	Years of schooling	Corp. tax	NR export	IRR	FMD
L0.control		0.00	-0.11	-0.01	0.09	0.01	-0.00	-0.01	0.54***
		(0.65)	(0.24)	(0.74)	(0.31)	(0.18)	(0.89)	(0.51)	(0.00)
L1.control			0.15						
			(0.15)						
Observations	1,368	1,343	1,367	1,368	1,416	1,286	1,305	1,164	1,338
Number of countryid	147	143	146	147	148	143	137	118	143
No. Instruments	33	35	37	39	36	36	37	34	39
Sargan p-value	0.41	0.12	0.55	0.60	0.08	0.71	0.01	0.05	0.24
Hansen p-value	0.87	0.91	0.84	0.80	0.81	0.65	0.78	0.66	0.94
AR1 p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-value	0.87	0.57	0.64	0.80	0.31	0.65	0.40	0.51	0.95
p-value in parentheses; *** p<0.01, ** p<0.05, * p<0.1									
Joint test significance (p-value)									
HFR (L0 or L1) is significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
HFR (L0 & L1)			0.03	0.01				0.25	
HFR, HFR^2, HFLGDP	0.00	0.00	0.10	0.07	0.01	0.03	0.05	0.47	0.01
HFR, HFLGDP	0.00	0.20	0.07	0.03	0.01	0.03	0.04	0.39	0.06
HF, HFR^2	0.09	0.02	0.07	0.03	0.01	0.01	0.05	0.42	0.02
Assumption on control		Endo	Endo	Exo	Predet	Endo	Exo	Predet	Exo
Cumulative marginal effect									
hf	1.33	0.98	1.30	1.75	3.42	1.33	3.65	1.25	1.13
hfhf	-0.02	-0.01	-0.02	-0.04	-0.15	-0.01	-0.14	-0.02	0.01
hflgdp	-0.12	-0.08	-0.11	-0.16	-0.22	-0.14	-0.25	-0.12	-0.12
Test for non-endogenous assumption (Incremental Hansen p-value of the associate GMM instrument)									
- HF is exogenous - Lag(0 1)	0.01	0.00	0.06	0.87	0.79	0.06	0.85	0.23	0.01
- HF is predetermined - Lag(1 1)	0.00	0.00	0.03	0.23	0.58	0.12	0.61	0.15	0.00

Notes: HFR = hiring and firing regulation; Corp. tax = corporate income tax; NR export = natural resources export; IRR = internal rate of return; FMD = financial market depth.

The inclusion of hf^2 seems problematic in some models. First, the estimates of hf^2 in four out of nine models are not significant. Second, when hf^2 coefficients are significant, the magnitudes are close to zero or the signs of L0 and L1 estimates are different and nullify each other. For example, in Model (9), the coefficient for the contemporaneous variable (L0. hf^2) is 0.01, but its first lag coefficient is -0.01. However, hf^2 is necessary in some models as indicated by high Hansen *p*-value high low information criteria (Appendix 7).

The assumption that HFR is exogenous is only valid in Model (4), (5), and (7). The validity can be interpreted from the incremental Hansen *p*-value of exogenous lag higher than 0.5 in these models.[16] When HFR is treated as exogenous, the results are not so different (not reported). Therefore, we only report the estimation that assumes HFR is endogenous. Meanwhile, the control variables are treated differently across models depending on the non-endogenous assumption validity based on their incremental Hansen *p*-value as well as the the underlying theory. For example, trade openness can be treated as exogenous in Model (2) based on its incremental Hansen *p*-value. Still, we treat it as endogenous, assuming that FDI and trade openness affect each other. The results of these two treatments are not significantly different. Table 3 shows that the joint test between HFR and its interaction term (HFLGDP) are significant, except in Model (2) and Model (8). However, the joint tests are significant based on a different preferred specification as discussed in the robustness test section.[17] Hence, there is sufficient evidence that a flexible HFR positively impact the FDI accumulation, and the impact is heterogeneous across income levels.

[16] Kiviet (2020) suggests that the exogenous assumption is valid when the incremental Hansen *p*-value of the associate GMM instrument is more than the threshold 0.3 – 0.5.
[17] The preferred model is the model excluding hf^2 from the equation.

Table 3. The significance of HFR and its joint test with the interaction term at α=10%

	(1)	(2)	(3)
	HFR coefficient	Joint test with HFLGDP	Joint test with HF2
Control variable			
1. Basic (no additional variable)	Yes	Yes	Yes
2. Trade openness	Yes	No*	Yes
3. Labour force	Yes	Yes	Yes
4. Working age	Yes	Yes	Yes
5. Years of schooling	Yes	Yes	Yes
6. Corporate tax	Yes	Yes	Yes
7. Natural resources	Yes	Yes	Yes
8. IRR	No*	No*	No*
9. Financial market depth	Yes	Yes	Yes

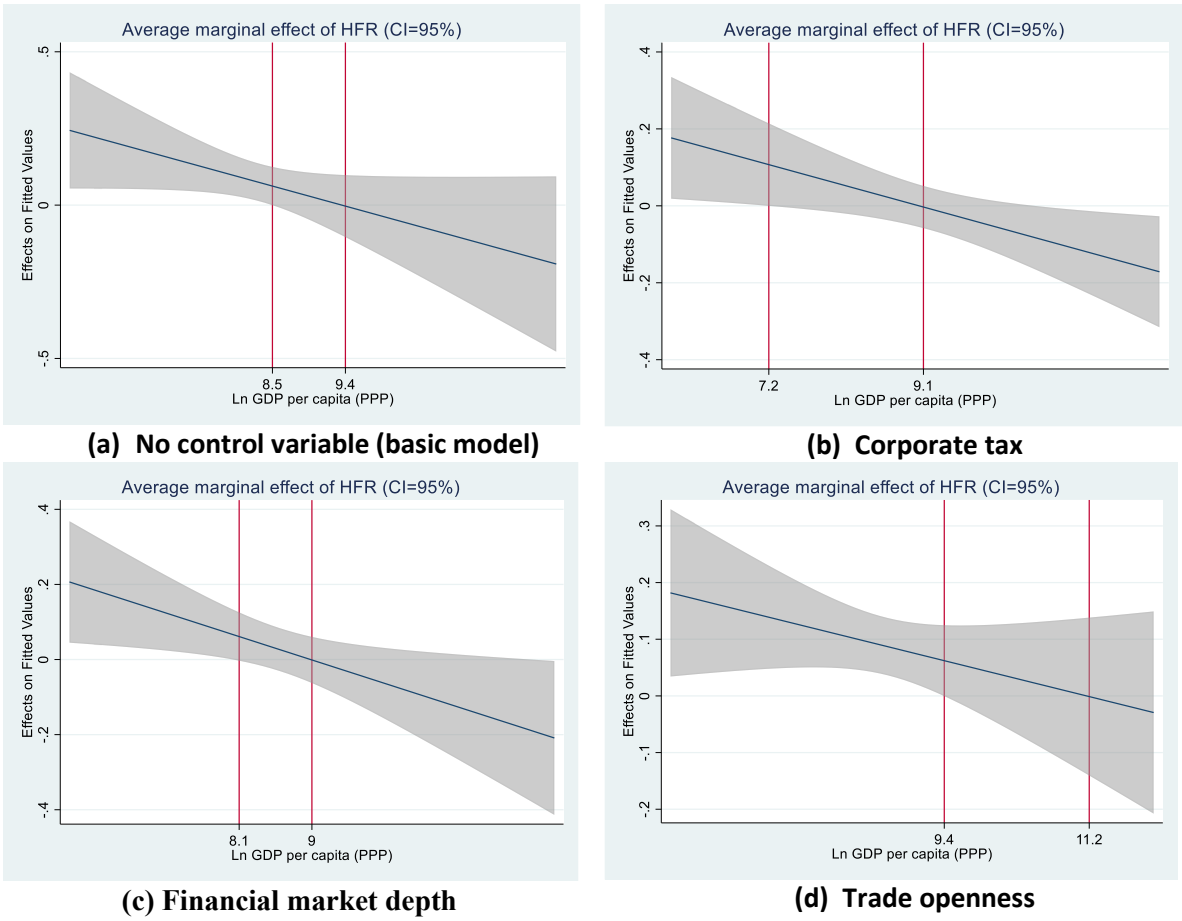
*Notes: * It becomes Yes (significant) based on the preferred specification discussed in the robustness test section*

6.2 The heterogeneous impact of HFR across income levels

Figure 7 illustrates the heterogeneous impact of HFR across income levels based on four different models.[18] The four panels show a similar pattern: HFR is significant in attracting FDI, especially in lower-income countries. The impact loses its power when the income level is sufficiently high. Different models give different threshold when the effects of HFR diminish. For illustration, in panel (a), the basic model suggests that the impact of HFR becomes negative when the log of GDP per capita (PPP) is 9.4 or equivalent to GDP per capita (PPP) of $12,000. However, the significance diminishes when the country's income level is around $5,400 PPP or 8.6 in the log term. The inclusion of different control variables shift the threshold downward or upward. When corporate tax is controlled for (panel b), the impact of HFR is insignificant when the GDP per capita (PPP) is below $1,500 or 7.2 in its log form. Meanwhile, the inclusion of trade openness suggests that HFR is still significant for a country with an income level of around $12,000 (log GDP per capita of 9.4).

[18] The impact is evaluated when HFR equals to 4.74, that is, the average HFR index among all observations.

Figure 7. The heterogeneous impact of hiring and firing regulation with different control variables



The reason why HFR is more significant in low-income countries is most likely related to the FDI motives. FDI flows to low-income countries are dominated by labour-intensive industries (OECD, 2019) that rely on labour regulation. A rigid HFR would increase the firing cost when a firm faces a decline in demand which is unfavourable for multinational firms. Meanwhile, the insignificant (or in some cases, negative) impact of the regulation in high-income countries is in line with studies by Wasmer (2006) and Acharya (2019). They imply that a rigid HFR potentially fits countries with high investments in advanced technology or high-skilled human capital. However, we cannot distinguish the impact of employment protection across different types of investment as this study uses aggregate FDI data.

6.3 Robustness tests

We check the results' robustness using two different specifications: (i) omitting the square of the regulation (HFR^2) and (ii) dropping both squared terms (HFR^2 and $LGDP^2$). Table 5

compares the estimate of HFR and its joint test with HFLGDP under three different specifications (see Appendix 4 and 5 for the complete results). The grey-shaded area highlights the preferred model based on Akaike information criteria (AIC) and Hanan-Quinn information criteria (HQ-IC) (see Appendix 7 for the full report on the selection criteria).

Panel (a) shows that flexible HFR positively affects FDI accumulation when control variables are included in the equations. While HFR is not significant in column (1), the alternative specification that excludes HFR^2 (column 2) suggests that the impact is statistically significant. The alternative specification is preferred for the models that control for trade openness and IRR based on the information criteria. Column (3) shows that excluding HFR^2 and $LGDP^2$ also produces significant estimates for HFR in all models, but the specification is not preferable compared to the other ones in column (1) and (2). Hence, we conclude that HFR's impact on FDI is positive, and the result is robust under different specifications.

Meanwhile, panel (b) suggests that HFR's impact on FDI is heterogeneous. It is positive but decreasing with respect to income level. The conclusion is robust based on the preferred model, as suggested by the information criteria.

Table 6. The significance of the estimates and the joint test

a. Hiring firing regulation

Assumption on HFR	(1) Including HFR^2 and $LGDP^2$	(2) Including $LGDP^2$ only	(3) Excluding HFR^2 and $LGDP^2$
Control variable			
1. Basic (no additional variable)	Yes	Yes	Yes
2. Trade openness	Yes	Yes	Yes
3. Labour force	Yes	Yes	Yes
4. Working age	Yes	Yes	Yes
5. Years of schooling	Yes	Yes	Yes[19]
6. Corporate tax	Yes	Yes	Yes
7. Natural resources	Yes	Yes	Yes
8. IRR	No	Yes	Yes
9. Financial market depth	Yes	Yes	Yes

b. The joint test HFR and HFLGDP

Assumption on HFR	Including HFR^2 and $LGDP^2$	Including $LGDP^2$ only	Excluding HFR^2 and $LGDP^2$
Control variable			
1. Basic (no additional variable)	Yes	Yes	No
2. Trade openness	No	Yes	Yes
3. Labour force	Yes	No	No
4. Working age	Yes	No	Yes
5. Years of schooling	Yes	No	No
6. Corporate tax	Yes	Yes	No
7. Natural resources	Yes	No	Yes
8. IRR	No	Yes	No
9. Financial market depth	Yes	Yes	Yes

Notes: Grey-shaded columns are the preferred model based on AIC and HQ-IC criteria.

[19] The estimate is based on the model with exogenous assumption on the hiring and firing regulation. Under endogenous assumption, HFR is statistically insignificant (p-value = 0.162). However, the selection criteria (AIC, BIC, HQIC) show that the model with exogenous assumption on HFR is better with smaller information criteria.

7. Conclusion and discussion

Numerous studies have examined the importance of hiring and firing regulation in attracting FDI. These studies have, however, either failed to satisfactory capture heterogeneity among countries because of limited country and time coverage, or have not paid adequate attention to the endogeneity problem. This study has examined the heterogeneous impact of HFR across different income levels using a new dataset covering a large number of countries, while addressing systematically the endogeneity of the regulation and of the control variables.

This study provides robust evidence that flexible HFR is beneficial in attracting FDI, but it works more effectively for developing countries. This evidence is consistent with the theoretical postulate that the impact is ambiguous depending on the other factors affecting MNC's cost structure. The positive effects of HFR in low-income countries are most likely due to the FDI motive to exploit the abundant labour as most FDI to these countries are labour-intensive industry. As labour costs contribute more to the cost structure, firms prefer a country that provides flexibility in hiring and firing to anticipate the demand shocks. The findings suggest, in line with other studies, that rigid HFR does not necessarily affect FDI in high-skilled sectors that are more dominant in these countries.

There are some limitations of this study. First, the impact of HFR on FDI is conditional on the choice of control variables. This study only incorporates control variables with available data to maintain a sufficient number of countries included in the study to capture the variability across different income levels. Second, the study has not captured the impact of employment protection across different types of FDI, in particular, labour-intensive and capital-intensive investment.

This study brings two policy implications. First, developing countries have room to attract FDI by making their hiring and firing regulations more flexible. Second, as a country progresses it can afford to institute more rigid hiring and firing regulation with the objective to protect domestic workers while keeping foreign investors come.

References

Acharya, V.V., Baghai, R.P. and Subramanian, K.V., 2013. Labour laws and innovation. *The Journal of Law and Economics*, *56*(4), pp.997-1037.

Aleksynska, M., 2014. *Deregulating labour markets: how robust is the analysis of recent IMF working papers?*. International Labour Office.

Aleksynska, M. and Cazes, S., 2014. *Comparing indicators of labour market regulations across databases: A post scriptum to the employing workers debate*. Geneva: ILO.

Alimov, A., 2015. Labor market regulations and cross-border mergers and acquisitions. *Journal of International Business Studies*, *46*(8), pp.984-1009.

Arellano, M. and Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, *58*(2), pp.277-297.

ASEAN Briefing, 2018, "Termination of Employees in ASEAN, available online https://www.aseanbriefing.com/news/termination-employees-asean/ accessed on 25 January 2021.

Backus, D., Cooley, T. and Henriksen, E., 2014. Demography and low-frequency capital flows. *Journal of International Economics*, *92*, pp.S94-S102.

Bénassy-Quéré, A., Coupet, M. and Mayer, T., 2007. Institutional determinants of foreign direct investment. *World economy*, *30*(5), pp.764-782.

Blundell, R. and Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, *87*(1), pp.115-143.

Bond, S.R., 2002. Dynamic panel data models: a guide to micro data methods and practice. *Portuguese economic journal*, *1*(2), pp.141-162.

Borensztein, E., De Gregorio, J. and Lee, J.W., 1998. How does foreign direct investment affect economic growth?. *Journal of international Economics*, *45*(1), pp.115-135.

Campos, N. F. and Kinoshita, Y., 2003. Why does FDI go where it goes? New evidence from the transition economies. *IMF Working Paper* No. 03/228, Available at SSRN: https://ssrn.com/abstract=880925

Cheng, L.K. and Kwan, Y.K., 2000. What are the determinants of the location of foreign direct investment? The Chinese experience. *Journal of international economics*, *51*(2), pp.379-400.

Corden, W.M. and Neary, J.P., 1982. Booming sector and de-industrialisation in a small open economy. *The economic journal*, *92*(368), pp.825-848.

David, M.A., Lambert, F. and Toscani, M.F.G., 2019. *More work to do? Taking stock of Latin American labor markets*. International Monetary Fund.

Davies, R.B. and Vadlamannati, K.C., 2013. A race to the bottom in labor standards? An empirical investigation. *Journal of Development Economics*, *103*, pp.1-14.

De Mello Jr, L.R., 1997. Foreign direct investment in developing countries and growth: A selective survey. *The Journal of Development Studies*, *34*(1), pp.1-34.

Dewit, G., Görg, H. and Montagna, C., 2009. Should I stay or should I go? Foreign direct investment, employment protection and domestic anchorage. *Review of world Economics*, *145*(1), pp.93-110.

Dewit, G., Leahy, D. and Montagna, C., 2013. Employment protection, flexibility and firms' strategic location decisions under uncertainty. *Economica*, *80*(319), pp.441-474.

Dewit, G., Görg, H. and Temouri, Y., 2019. Employment protection and firm relocation: Theory and evidence. *Economica*, *86*(344), pp.663-688.

Delbecque, V., Méjean, I. and Patureau, L., 2014. Labor market institutions and firms' location choices. *Review of World Economics*, *150*(1), pp.115-148.

Dixit, A., 1989. Entry and exit decisions under uncertainty. *Journal of Political Economy*, *97*(3), pp.620-638.

Duval, M.R.A. and Loungani, M.P., 2019. Designing Labor Market Institutions in Emerging and Developing Economies: Evidence and Policy Options. International Monetary Fund.

Eslava, M., Haltiwanger, J., Kugler, A. and Kugler, M., 2004. The effects of structural reforms on productivity and profitability enhancing reallocation: evidence from Colombia. *Journal of Development Economics*, *75*(2), pp.333-371.

Faria, A. and Mauro, P., 2009. Institutions and the external capital structure of countries. *Journal of International Money and Finance*, *28*(3), pp.367-391.

Feenstra, R.C., Inklaar, R. and Timmer, M.P., 2015. The next generation of the Penn World Table. *American economic review*, *105*(10), pp.3150-82., available for download at www.ggdc.net/pwt

Feldstein, M. and Horioka, C., 1979. *Domestic savings and international capital flows* (No. w0310). National Bureau of Economic Research.

Freeman, R.B., 2010. Labor regulations, unions, and social protection in developing countries: Market distortions or efficient institutions?. *Handbook of development economics*, *5*, pp.4657-4702.

Global Payroll Management Institute, *"Terminating an Employee in Vietnam"*, http://www.gpminstitute.com/publications-resources/Global-Payroll-Magazine/january-2016-issue/terminating-an-employee-in-vietnam accessed on 25 January 2021

Görg, H., 2005. Fancy a stay at the 'Hotel California'? The role of easy entry and exit for FDI. *Kyklos*, *58*(4), pp.519-535.

Griffith, R. and Macartney, G., 2014. Employment protection legislation, multinational firms, and innovation. *Review of Economics and Statistics*, *96*(1), pp.135-150.

Gwatrney, J., Lawson, R. and Hall, J., 2019. *Economic Freedom of the World: 2010 Annual Report*. Vancouver, BC: Fraser Institute.

Head, K., Ries, J. and Swenson, D., 1995. Agglomeration benefits and location choice: Evidence from Japanese manufacturing investments in the United States. *Journal of International Economics*, *38*(3-4), pp.223-247.

Javorcik, B., 2012. Does FDI Bring Good Jobs to Host Countries?. Background Paper for the World Development Report 2013;. World Bank, Washington, DC. Available at https://openknowledge.worldbank.org/handle/10986/12132

Javorcik, B.S. and Spatareanu, M., 2005. Do foreign investors care about labor market regulations?. *Review of World Economics*, *141*(3), pp.375-403.

Karabegović, A., Godin, K., Clemens, J. and Veldhuis, N., 2004. Measuring the Flexibility of Labour Relations Laws in Canada and the United States, Fraser Institute Digital Publication

Kinoshita, Y. and Mody, A., 2001. Private information for foreign investment in emerging economies. *Canadian Journal of Economics/Revue canadienne d'économique*, *34*(2), pp.448-464.

Kiviet, J.F., 2020. Microeconometric dynamic panel data methods: Model specification and selection issues. *Econometrics and Statistics*, *13*, pp.16-45.

Klein, M., Aaron, C. and Hadjimichael, B., 2001. *Foreign direct investment and poverty reduction*. The World Bank.

Knickerbocker, F.T., 1973. Oligopolistic reaction and multinational enterprise. *The International Executive*, *15*(2), pp.7-9.

Kripfganz, S., 2019. Generalized method of moments estimation of linear dynamic panel data models. *Proceedings of the 2019 London Stata Conference*.

Kuddo, A., 2018. *Labor Regulations throughout the World : An Overview*. Jobs Working Paper, No. 16. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/30106 License: CC BY 3.0 IGO."

Kugler, A. and Kugler, M., 2009. Labor market effects of payroll taxes in developing countries: Evidence from Colombia. *Economic development and cultural change*, *57*(2), pp.335-358.

Lane, P.R. and Milesi-Ferretti, G.M., 2001. Long-term capital movements. *NBER macroeconomics annual*, *16*, pp.73-116.

Lipsey, R.E., 2001. *Foreign direct investors in three financial crises.* Working Paper Series No.8084. National Bureau of Economic Research.

Mason, A., Lee, R. and Jiang, J.X., 2016. Demographic dividends, human capital, and saving. *The Journal of the Economics of Ageing*, *7*, pp.106-122.

Narciso, A., 2010. The impact of population ageing on international capital flows. *Available at SSRN 1702995*.

Noorbakhsh, F., Paloni, A. and Youssef, A., 2001. Human capital and FDI inflows to developing countries: New empirical evidence. *World development*, *29*(9), pp.1593-1610.

OECD, 2013, *"Protecting jobs, enhancing flexibility: A new look at employment protection legislation"*, in OECD Employment Outlook 2013, OECD Publishing. Available on htttp://dx.doi.org/10.1787/empl_outlook-2013-6-en

OECD, 2019. *FDI qualities indicators, Measuring the sustainable development impacts of investment*, OECD Publishing, https://www.oecd.org/investment/FDI-Qualities-Indicators-Measuring-Sustainable-Development-Impacts.pdf

Ohanian, L.E. and Wright, M.L., 2010. Capital flows and macroeconomic performance: lessons from the golden era of international finance. *American Economic Review*, *100*(2), pp.68-72.

Olney, W.W., 2013. A race to the bottom? Employment protection and foreign direct investment. *Journal of International Economics*, *91*(2), pp.191-203.

Parcon, H., 2008. Labor market flexibility as a determinant of FDI inflows. *University of Hawaii at Manoa, Department of Economics, Working Papers*, pp.08-07.

Prasad, E., Rajan, R. and Subramanaian, A., 2007. The paradox of capital, finance and development. *IMF, March*, *44*.

Roodman, D., 2009a. A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics*, 71(1), pp.135-158.

Roodman, D., 2009b. How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal*, *9*(1), pp.86-136.

Roser, M. and Ortiz-Ospina, E., 2016. Global Education. Our World in Data.

Roser, M. and Ortiz-Ospina, E. 2016. "Global Education". *Published online at OurWorldInData.org.* Retrieved from: 'https://ourworldindata.org/global-education' [Online Resource]

Sahay, R., Čihák, M., N'Diaye, P. and Barajas, A., 2015. Rethinking financial deepening: Stability and growth in emerging markets. *Revista de Economía Institucional*, *17*(33), pp.73-107.

Svirydzenka, K., 2016. Introducing a New Broad-Based Index of Financial Development. IMF Working Paper No. 16/5, Available at SSRN: https://ssrn.com/abstract=2754950

Vernon, R., 1992. International investment and international trade in the product cycle. In *International economic policies and their theoretical foundations* (pp. 415-435). Academic Press.

Wasmer, E., 2006. General versus specific skills in labor markets with search frictions and firing costs. *American Economic Review*, *96*(3), pp.811-831.

Walsh, J. P. and Yu, J. 2010. Determinants of Foreign Direct Investment: A Sectoral and Institutional Approach (July 2010). IMF Working Paper No. 10/187, Available at SSRN: https://ssrn.com/abstract=1662260

Wheeler, D. and Mody, A., 1992. International investment location decisions: The case of US firms. *Journal of international economics*, *33*(1-2), pp.57-76.

Wooldridge, J.M., 2016. *Introductory econometrics: A modern approach*. Nelson Education.

OECD (2020), *OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis*, OECD Publishing, Paris, Available at https://doi.org/10.1787/1686c758-en.

Appendix 1. FDI, employment protection, and domestic anchorage (Dewit et al., 2009).

Dewit et al. (2009) develop the model of location decision for a monopolist firm in two periods and each period has two stages. The investment location is either in the home country (refer to as 'home' or 'h' in a subscript) or in a foreign country (refer to as 'foreign' or 'f'). To isolate the impact of employment protection, the model assumes that other factors such as market size are similar

Demand in period one is defined as $p_1 = a - bq_1$ where p and q are price and quantity. There are two possible levels of demand in period 2: it is as much as the demand in period 1 with probability ρ, or higher with probability $1 - \rho$. When the demand in period 2 is higher, we have a positive demand shock, $\varepsilon > 0$, such that $p_2 = a - bq_2 + \varepsilon$. In this case, the firm that is initially located in 'home' would not relocate to 'foreign'.

Because demand in the future is uncertain, the firms prefer a location with flexibility in employment protection regulation. Flexible employment protection means lower exit costs.

The firm's cost structure includes the fixed cost of setting up the plant and variable cost for production. The fixed cost in home- and foreign country are $\emptyset^h$ and $\emptyset^f$, respectively, while the marginal costs of production are denoted $c^h$and c^f. It is assumed that $\emptyset^f > \emptyset^h$ because the firm has to incur additional costs for locating in a foreign country.

The employment protection affects the firm's cost when the demand in period two falls and the cost is denoted as $\lambda^i(q_1^i - q_2^i)$ where $q_1^i > q_2^i$ and λ^i refers to the degree of employment protection in country i with $i = h, f$.

The sequence of firm's decision is as follows:

Period 1	Stage 1	Location decision (h, f)
	Stage 2	Output decision
Period 2	Stage 3	Stay in home country or relocate to a foreign country
	Stage 4	Output decision

With such a sequence, there are four scenarios for firms (h_1, h_2), (h_1, f_2), (f_1, f_2), (f_1, h_2) with the first term in each bracket represents the initial location and the second term defines the location choice in period 2. The scenario (h_1, f_2) means the firm produces in the home country in period 1 and then relocates to a foreign country in period 2. The subscript 1 and 2 shows the period when the decision made.

The firm's decision to stay at home or relocate to a foreign country is driven by profit consideration. For a firm that is initially located in the home country, it will move to a foreign country in period 2 if $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$. Note that the firm will have chosen 'home' in

period 1 if $E\pi(h_1) > E\pi(f_1)$. Due to this backward induction, we should consider the firm's decision in period two first.

1. Period 2: relocating to foreign country or staying at home

In period 2, the firm has an option to relocate to a foreign country or to stay at home. The firm will move out if the profit in the foreign country is higher than that at home, $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$. The profit function $\pi_2(h_1, f_2)$ is given by:

$$\pi_2(h_1, f_2) = (p_2 - c^f)q_2^f - \lambda^h q_1^h - \emptyset^f \quad (1)$$

Where $(p_2 - c^f)q_2^f$ represents the operating profit from producing in foreign country in period 2, while $\lambda^h q_1^h$ is the exit costs such as severance payments in the home country. The exit cost will be higher if the degree of employment protection in the home country (λ^h) is higher. The optimal output after the relocation in period 2 is calculated by setting $\partial\pi_2/\partial q_2^f = 0$. There are two possible levels of optimal output q_2^f:

$$q_2^f = (a - c^f)/2b \qquad \text{if } p_2 = a - bq_2 \quad (2a)$$

$$q_2^f = (a - c^f + \varepsilon)/2b \qquad \text{if } p_2 = a - bq_2 + \varepsilon \quad (2b)$$

If the demand shock, ε, is larger, q_2^f will be larger and the operating profit, $(p_2 - c^f)q_2^f$, will also be larger. However, the profit will also depend on the cost of relocating and setting up the new plant, $\emptyset^f$.

If the firm chooses to stay at home, the profit function by maintaining the plant at home is:

$$\pi_2(h_1, h_2) = (p_2 - c^h)q_2^h - I\lambda^h(q_1^h - q_2^h) \quad (3)$$

Where I is an indicator variable $I = 1$ if $q_1^h > q_2^h$ and $I = 0$ otherwise. The firm has to pay an extra cost, for example, for laying off workers when the demands decline in period 2. The optimal output in period 2 should the firm choose to stay at home is obtained by maximizing equation 3 with respect to q_2^h, $\partial\pi_2/\partial q_2^h = 0$.

$$q_2^h = (a - c^h + I\lambda^h)/2b \qquad \text{if } p_2 = a - bq_2 \quad (4a)$$

$$q_2^h = (a - c^h + \varepsilon + I\lambda^h)/2b \qquad \text{if } p_2 = a - bq_2 + \varepsilon \quad (4b)$$

Under the condition that the firm will move to foreign country if $\pi_2(h_1, f_2) > \pi_2(h_1, h_2)$, the factor that affects the decision is identifiable by comparing equation 1 and equation 3. In the case that 2b and 4b hold, the relocation decision equation becomes:

$$\frac{(a-c^f)^2-(a-c^h+I\lambda^h)^2}{4b}+\frac{\varepsilon(c^h-I\lambda^h-c^f)}{2b}>\phi^f+(1-I)\lambda^h q_1^h \quad (5)$$

Based on equation 5, the probability for the firm to relocate is higher when: (i) the positive demand shock (ε) is larger, (ii) the cost of FDI (ϕ^f) is lower, and (iii) the employment protection (λ^h) in the home country is lower. The last condition contradicts the traditional view that always sees employment protection to be lower. In this model, strict employment protection might have an anchored effect for outward FDI in period 2.

2. Period 1: the initial location decision

a. Choosing to locate in the home country in period one

The firm will choose to locate in the home country if the expected profit there is higher than that in a foreign country, $E\pi(h_1) > E\pi(f_1)$. With an assumption that the market size is similar, this condition is satisfied if the marginal cost in the home country is lower than the marginal cost in a foreign country ($c^h < c^f$). Otherwise, it must be the case that the cost of FDI in a foreign country is sufficiently high $\emptyset^f > \emptyset^h$, to exploit the low marginal cost in a foreign country.

The expected profit in the home country in period 1 is $E\pi(h_1) = \pi_1^{h_1} + E\pi_2^{h_1}$, with profit in period one is $\pi_1^{h_1} = (p_1 - c^h)q_1^h - \emptyset^h$. If the condition in equation five is satisfied, the firm's expected profit in period 2 if it relocates to a foreign country given that it now operates in the home country in period 1 is $E\pi_2^{h_1} = \rho\pi_2^{h_1h_2} + (1-\rho)\,\pi_2^{h_1f_2}$. The firm's optimal output in period one is calculated by combining these equations with equations 1 and 3 and maximizing the total expected profit with respect to q_1^h or by setting $\partial E\pi(h1)/\partial q_1^h = 0$.

$$q_1^h = \frac{a-c^h-(1-\rho)\lambda^h-I\rho\lambda^h}{2b} \quad (6)$$

If $q_1^h < q_2^h$, there is no redundancy cost, so $I = 0$. Hence, equations (4a) and (6) respectively become:

$$q_2^h = \frac{(a-c^h+I\lambda^h)}{2b} \text{ and } q_1^h = \frac{a-c^h-(1-\rho)\lambda^h}{2b} \quad (7)$$

Equation (7) shows that when the firm chooses to locate at home, the output is smaller when the employment protection is higher. This action is taken to get rid of the potential exit cost if the firm needs to relocate.

b. Choosing to locate in a foreign country in period 1

If the firm chooses the foreign location at period 1, the expected profit equation is $E\pi(f_1) = \pi_1^{f_1} + E\pi_2^{f_1}$ with $\pi_1^{f_1} = (p_1 - c^f)q_1^f - \emptyset^f$. The optimal output in period 1 is attained by setting $\partial\pi_1^{f_1}/\partial q_1^f = 0$ which produce equation (8):

$$q_1^f = \frac{(a - c^f)}{2b} \tag{8}$$

A firm that initially produces in a foreign country will stay producing there because of the lower marginal cost and lower employment protection. The firm's profit in period 2 is $\pi_2(f_1 f_2) = (p_2 - c^f)q_2^f$.

There are two possibilities of optimal output in period 2 that are obtainable by setting $\partial\pi_2(f_1 f_2)/\partial q_2^f = 0$. First, if the production in two periods is the same, the optimal output in period 2 is $(a - c^f)/2b$. In the presence of positive shock in period 2, the optimal demand will be $(a - c^f + \varepsilon)/2b$. Therefore, in period 1, the expected profits from producing in foreign country given that the firm's initial location is already there are $E\pi_2^{f_1} = \rho\frac{(a-c^f)^2}{4b} + (1 - \rho)\frac{(a-c^f+\varepsilon)^2}{4b}$.

The conditions for the firm to choose home as its initial location $E\pi(h_1) > E\pi(f_1)$ can be rewritten using equations (2b), (7), and (8).

$$\phi^h < \rho\left[\phi^f - \frac{(a - c^f)^2 - (a - c^h)^2}{4b}\right] - \frac{(a - c^f)^2 - \left[(a - c^h) - (1 - \rho)\lambda^h\right]}{2b} \tag{9}$$

Based on equation 9, the firm's decision to choose the initial location is determined by the fixed costs and employment protection level. The firm will choose the home country if ϕ^h is less than the maximum value ϕ^h that is represented by the terms at the right-hand side of equation (9). The right-hand-side terms also show that the higher the level of protection at home, the smaller the firm's probability to locate at home.

Appendix 2. The GMM implementation steps

We utilize the sequential stages recommended by Kiviet (2020) in implementing GMM. Given the objective of the study and considering the characteristic of the data, here is the estimation strategy:

1. We start with the basic model where the dependent variable is FDI stock (*fdi*) while the independent variables are the first and the second lags of FDI stock and those of the variables of interest. The unlagged form of the variables of interest are also included as the independent variables. These are hiring and firing regulation (hf), the squared term of the hiring and firing regulation (hf^2), GDP per capita ($lgdp$), the squared term of GDP per capita ($lgdp^2$), and the interaction between hiring and firing regulation with GDP per capita ($hflgdp$). The hiring and firing regulation (hf) is measured in an index form while $lgdp$ is the natural logarithm of country's GDP per capita which described in Table 1. We also include t-1 time dummies.
2. Next, we estimate the model using the two-step Arellano-Bond GMM with Windmeijer correction and treating all independent variable as endogenous. To avoid the problem of too many instruments as described by Roodman (2009a), we use the minimal set of lags, lag (2 5) with collapse option, separately for each independent variable to get the difference in Hansen *p*-value individually. If the number of lag instruments is appropriate as shown by the incremental Hansen p-value below 0.2, we change the number of lag included as the GMM instrument. We normally use lag(2 3) or lag (2 6) with collapse option.
3. After each estimation, we omit the regressors whose t-statistics is below 1, starting from the longest lag of the regressors (L1), either $x_{i,t}^{(m)}$ or $fdi_{i,t}$, with the lowest t-statistics. We repeat the omission until the available longest lag of each variable has a t-statistics more than 1. In this study, when the longest lag of available independent variable has a t-statistic more than 1, the GMM instrument seems valid. The GMM instrument is valid if it meets the criteria: (i) the instrument is jointly exogenous as shown by overall Hansen p-value above 0.2 and incremental Hansen p-value of each GMM subset above 0.2; and (ii) no-remaining second order serial correlation (AR2) as shown by p-value above 0.2 and the first order serial correlation (AR1) p-value below 0.05.
4. When the GMM instrument is valid, we then check if hiring and firing regulation (HFR) can be treated as predetermined by adding lag(1 1) as GMM instrument for the associated variable or as exogenous by adding lag(0 1). The non-endogenous assumption of HF is valid if the incremental Hansen p-value of the GMM instrument is above the threshold range 0.3-0.5. We report the results under both assumptions for comparison.

5. For a robustness test, we include control variables separately into the basic model and treating them as endogenous or exogenous if they pass the non-endogeneity test. Although they pass the validity test, we might treat them as endogenous with a consideration that the macro variables are likely affecting each other. For example, trade openness can be treated as exogenous but we prefer to treat them as endogenous considering its simultenous relationship with FDI. When a control variable is included, we repeat Step 1 to Step 4 and withdraw the conclusion when their longest lag regressors t-statistics are above 1 and their GMM instruments are valid. We do not omit the unlagged variables even if their t-statistics is below 1 to show their irrelevancy in the model.

6. For further robustness test, we check if the system GMM introduced by Blundell and Bond (1998) is appropriate. Kiviet (2020) argues that system GMM is valid when the lagged dependent variable is effect stationary, and for it to be effect stationary, all independent variable should also be effect stationary, that is, $x_{i,t}^{(m)}$, $E(\eta_i \Delta x_{i,t}^{(m)}) = 0$. To check the validity, his suggestion is to include the level of $fdi_{i,t}$ and $x_{i,t}^{(m)}$ as the instruments and then test the validity of each instrument based on their incremental Hansen p-value. He contends that system GMM is valid if the Incremental Hansen p-value of all instrument are above 0.3. Following this procedure, we find that system GMM is not appropriate for this study.

7. We also test the robustness by using two different specifications: (i) omitting the square of the regulation (hf^2), and (ii) dropping both squared terms (hf^2 and $lgdp^2$). For each specification, we repeat step 1 to step 5.

8. We use the sign of the cumulative marginal effect of variables and their joint test to assess the impact of hiring and firing regulation (HF and its interaction terms) on FDI accumulation at different economic development stages.. The calculation of the cumulative marginal effect follows the methodology described in Appendix 8.

9. Finally, we choose the best model based on the model information criteria (Akaike information criteria and Hanan-Quinn information criteria) to conclude the impact of hiring and firing regulation at different stages of economic development.

Appendix 3. Data descriptive and the correlation matrix

Variable	Obs	Mean	Std. Dev.	Min	Max
(1) Stock of Inward FDI (USD per capita)	2,074	55.55	128.82	0.00	1,811.63
(2) Hiring and firing (Index)	1,714	4.74	1.34	-	8.51
(3) GDP per capita (USD, PPP)	2,079	17,893.60	19,822.82	558.32	124,024.60
(4) Corporate income tax (%)	1,826	25.69	8.56	-	55.00
(5) Mean years of schooling (years)	2,086	7.95	3.22	1.20	14.10
(6) Trade openness (% of GDP)	2,014	90.91	55.95	0.17	442.62
(7) Labour force (% of total population)	2,080	43.98	8.57	21.78	75.80
(8) Natural resources export (USD per capita)	1,845	5.38	2.13	- 2.84	10.04
(9) Internal rate of return (%)	1,664	11.04	6.88	1.00	57.18
(10) Working age population (% of total population)	2,093	63.11	7.13	47.18	86.40
(11) Financial market depth (index)	2,028	0.24	0.29	-	1.00

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Stock FDI	1										
(2) HFR index	0.02	1									
(3) GDP per capita (ln)	0.85***	-0.06**	1								
(4) Corporate tax (%)	-0.29***	-0.24***	-0.24***	1							
(5) Years of schooling	0.77***	0.01	0.79***	-0.32***	1						
(6) Trade openness (% to GDP)	0.49***	0.20***	0.32***	-0.25***	0.28***	1					
(7) Labour force (%)	0.46***	0.13***	0.48***	-0.24***	0.52***	0.16***	1				
(8) Export of natural resources	0.82***	-0.05*	0.83***	-0.21***	0.74***	0.41***	0.45***	1			
(9) Internal rate of return (%)	-0.07***	-0.06**	-0.07***	0.04	-0.22***	0.03	-0.10***	-0.08***	1		
(10) Working age population (%)	0.68***	0.08***	0.80***	-0.43***	0.74***	0.34***	0.61***	0.67***	-0.08***	1	
(11) Financial market depth index	0.62***	-0.01	0.67***	0.01	0.54***	0.22***	0.46***	0.61***	-0.09***	0.48***	1

Appendix 4. The comparison of firing regulations in Indonesia, Philippines, and Vietnam

	Vietnam**	Indonesia*	Philippines*
Terminations	Allowed in five instances: 1) poor performances; 2) long leaves due to sickness; 3) business scale down due to natural disaster, fire, and force majeure; 4) military call or drug or pregnant, or agreed suspension; 5) structural changes, economic reasons, merger & consolidation.	Prohibited on the grounds of marriage, race, religion, gender, health, ideology, or work-related sickness.	▪ Not allowed at any time without cause. ▪ Possible if there is a legal authorized cause
Notice period	45 days for an indefinite-term contract 30 days for definite contract	▪ Not specified by the regulation; 30-day notice in practice. ▪ Approval from Industrial Relations Court is necessary.	▪ Two written notice are required with the second notice issued when the ground for termination is sufficient. ▪ Formal hearing is necessary for certain cases
Severance payment	▪ Entitled for employee who have works for more than 12 months. ▪ Half a month's salary for every year of services ▪ Full month's salary for each year service for termination number 5).	▪ Standard severance pay: one-month salary for each year of service up to nine month salary. ▪ Service appreciation: two-month salary for the first three years of service, and additional month's salary for every three year of services up to 10-month salary. ▪ Monetary compensation: unexpired annual leave, medical & housing allowance, other benefit, and other compensation as determined by IRC.	At least one month pay for each of year of service

*) https://www.aseanbriefing.com/news/termination-employees-asean/

**) http://www.gpminstitute.com/publications-resources/Global-Payroll-Magazine/january-2016-issue/terminating-an-employee-in-vietnam

Appendix 5. Impact of HFR on FDI when HFR^2 is omitted but $LGDP^2$ is included

Dependent variable : FDI Stock (fdi)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L1 of stock FDI	0.64***	0.83***	0.73***	0.76***	0.72***	0.58***	0.65***	0.58***	0.57***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HFR index	0.94**	0.37	0.73**	1.51**	0.69*	1.07**	0.53	1.34***	0.92***
	(0.01)	(0.15)	(0.02)	(0.01)	(0.07)	(0.01)	(0.20)	(0.01)	(0.00)
L1 of HFR index	-0.08*	-0.10**	-0.06	-0.56			-0.09*	-0.10	-0.09**
	(0.08)	(0.04)	(0.15)	(0.19)			(0.05)	(0.12)	(0.04)
HFR index * GDP per capita	-0.10**	-0.02	-0.08**	-0.18***	-0.09*	-0.10**	-0.05	-0.15**	-0.10***
	(0.04)	(0.41)	(0.03)	(0.01)	(0.07)	(0.04)	(0.34)	(0.01)	(0.01)
L1 of HFR index * GDP per capita				0.06		-0.01**			
				(0.21)		(0.04)			
GDP per capita	7.11***	4.07**	5.80**	11.23***	4.53**	-18.45*	8.25***	7.12	7.00***
	(0.01)	(0.02)	(0.01)	(0.00)	(0.04)	(0.08)	(0.00)	(0.12)	(0.00)
L1 of GDP per capita				-4.15**	-1.66	22.31**			
				(0.01)	(0.20)	(0.04)			
Squared GDP per capita	-0.34**	-0.17	-0.28**	-0.34**	-0.14*	0.92*	-0.40***	-0.36	-0.34**
	(0.02)	(0.11)	(0.02)	(0.04)	(0.09)	(0.06)	(0.00)	(0.18)	(0.01)
L1 of squared GDP per capita						-1.07**			
						(0.04)			
Control variable		Trade openness	Labor force	Working age	YoS	Corp. tax	NR export	IRR	FMD
L0.Control variable		0.00	-0.16*	0.14	0.60*	-0.04	-0.05	-0.01	1.45*
		(0.78)	(0.07)	(0.15)	(0.05)	(0.27)	(0.59)	(0.59)	(0.05)
L1.Control variable			0.19**	-0.19*	-0.66**	0.04		-0.03	
			(0.04)	(0.08)	(0.03)	(0.28)		(0.26)	
Observations	1,368	1,343	1,367	1,368	1,416	1,261	1,272	1,164	1,338
Number of countryid	147	143	146	147	148	142	136	118	143
No. Instruments	31	35	35	35	31.00	34	35	35	35
Sargan p-value	0.10	0.08	0.53	0.11	0.38	0.70	0.00	0.02	0.10
Hansen p-value	0.50	0.66	0.97	0.83	0.88	0.92	0.67	0.50	0.91
AR1 p-value	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
AR2 p-value	0.76	0.57	0.47	0.53	0.59	0.36	0.93	0.98	0.82
pval in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									
Joint test significance (p-value)									
HFR (L0 or L1) is significant	YES	YES	YES	YES	YES	YES	YES	YES	YES
HFR (L0 & L1)	0.01	0.09	0.05	0.02			0.08	0.03	0.01
HFR and HFR * GDP per capita	0.03	0.09	0.10	0.10	0.18	0.01	0.17	0.07	0.03
All Incr. Hansen > 0.2	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cumulative marginal effect									
HFR	1.16	1.04	1.20	1.35	1.22	1.20	0.90	1.26	1.00
HFR * GDP per capita	-0.16	-0.04	-0.14	-0.26	-0.15	-0.17	-0.08	-0.24	-0.16

***Notes**: YoS=years of schooling; Corp. Tax=Corporate tax; NR Export=natural resources export; IRR=internal rate of return; FMD= Financial market depth.*

Appendix 6. Impact of HFR on FDI when the squared terms (HFR^2 and $LGDP^2$) are omitted

Dependent variable : FDI Stock (fdi)

	(1)	(2)	(3)	(4)	(5E)	(5X)	(6)	(7)	(8)	(9)
L1 of stock FDI	0.73***	0.75***	0.79***	0.68***	0.69***	0.73***	0.82***	0.67***	0.57***	0.79***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HFR index	1.739**	0.67*	0.93*	1.80***	0.89	0.85**	0.73**	1.01**	1.53*	0.90**
	(0.05)	(0.09)	(0.07)	(0.00)	(0.16)	(0.01)	(0.03)	(0.02)	(0.09)	(0.03)
L1 of HFR index	-0.76	-0.09**	-0.06	-0.80*			-0.09*	-0.12**	-0.81	
	(0.16)	(0.03)	(0.11)	(0.09)			(0.07)	(0.03)	(0.19)	
HFR index * GDP per capita	-0.18*	-0.06	-0.11*	-0.21***	-0.11	-0.09**	-0.07*	-0.10**	-0.16*	-0.09**
	(0.07)	(0.19)	(0.06)	(0.01)	(0.12)	(0.01)	(0.08)	(0.04)	(0.10)	(0.03)
L1 of HFR index * GDP per capita	0.08			0.09					0.08	
	(0.20)			(0.11)					(0.23)	
GDP per capita	1.87***	1.54***	5.28	4.99***	3.27**	2.49*	1.37***	2.18***	1.54***	1.38***
	(0.00)	(0.01)	(0.12)	(0.01)	(0.05)	(0.09)	(0.00)	(0.00)	(0.00)	(0.01)
L1 of GDP per capita			-4.01	-3.76**	-2.11	-1.09				
			(0.28)	(0.02)	(0.22)	(0.45)				
Control variable		Trade openness	Labor force	Working age pop	Years of schooling	Years of schooling	Cortax	Natural Resources Export	IRR	Financial market depth
L0 of control variable		-0.00	-0.08	0.30**	1.00**	0.82**	0.01	-0.14	-0.02	0.95
		(0.44)	(0.27)	(0.02)	(0.03)	(0.02)	(0.59)	(0.38)	(0.19)	(0.25)
L1 of control variable				-0.29*	-0.86*	-0.59*		0.14		-1.35*
				(0.07)	(0.08)	(0.10)		(0.26)		(0.07)
Observations	1,368	1,343	1,367	1,368	1,416	1,416	1,286	1,257	1,164	1,385
Number of countryid	147	143	146	147	148	148	143	134	118	144
No. Instruments	27	31	31	31	31	33	28	31	27	31
Sargan p-value	0.00	0.01	0.14	0.00	0.15	0.01	0.9	0.00	0.02	0.03
Hansen p-value	0.67	0.81	0.89	0.65	0.95	0.90	0.71	0.81	0.42	0.57
AR1 p-value	0.00	0.00	0.01	0.00	0.01	0.00	0	0.00	0	0.00
AR2 p-value	0.73	0.71	0.56	0.35	0.58	0.57	0.39	0.98	0.51	0.77
pval in parentheses										
*** p<0.01, ** p<0.05, * p<0.1										
Joint test significance (p-value)										
HFR (L0 or L1) is significant	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES
HFR (L0 & L1)	0.08	0.02		0.01			0.06	0.02	0.20	
HFR and HFR * GDP per capita	0.11	0.04	0.17	0.02	0.25	0.00	0.10	0.06	0.26	0.08
Exogeneity : Incr. Hansen lag (0 1)						0.63				
All Incr. Hansen > 0.2	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cumulative marginal effect										
HFR index	2.25	1.08	1.60	2.22	1.50	1.47	1.24	1.57	1.59	1.61
HFR and HFR * GDP per capita	-0.23	-0.11	-0.20	-0.26	-0.19	-0.16	-0.13	-0.17	-0.17	-0.16

***Notes**:*

- *Corp. Tax=Corporate tax; FMD= Financial market depth.*
- *Model 5E assumes HFR is endogenous, Model 5X assumes HFR is exogenous. The exogenous assumption is valid as the incremental Hansen p-value of lag(0 1) is 0.63.*

Appendix 7 – The information criteria in three specifications

Akaike information criteria (AIC)

Model based on control variable	Including hf^2 and $lgdp^2$	Including $lgdp^2$ only	Excluding hf^2 and $lgdp^2$
1. Basic (no additional variable)	-20.87	-14.65	-12.42
2. Trade openness	-22.91	-19.86	-18.68
3. Labour force	-22.74	-24.62	-18.68
4. Working age	-24.28	-18.94	-13.33
5. Years of schooling	-23.29	-17.28	-20.22
6. Corporate tax	-28.89	-19.34	-13.96
7. Natural resources	-23.90	-20.10	-17.51
8. IRR	-15.25	-16.69	-8.83
9. Financial market depth	-28.88	-24.23	-15.50

Bayesian information criteria (BIC)

1. Basic (no additional variable)	-65.83	-56.61	-42.39
2. Trade openness	-70.42	-70.35	-60.26
3. Labour force	-73.58	-72.47	-57.56
4. Working age	-81.23	-60.90	-46.30
5. Years of schooling	-78.07	-53.80	-59.78
6. Corporate tax	-116.77	-57.95	-46.85
7. Natural resources	-80.06	-69.87	-55.47
8. IRR	-62.50	-61.15	-33.84
9. Financial market depth	-88.28	-74.72	-57.74

Hanan-Quinn information criteria

1. Basic (no additional variable)	-39.62	-32.15	-24.92
2. Trade openness	-42.73	-40.92	-36.03
3. Labour force	-43.95	-44.58	-34.90
4. Working age	-48.03	-36.44	-27.08
5. Years of schooling	-46.12	-32.50	-36.71
6. Corporate tax	-65.52	-35.44	-27.68
7. Natural resources	-47.33	-40.87	-33.35
8. IRR	-34.97	-35.24	-19.27
9. Financial market depth	-53.66	-45.29	-33.11

Appendix 8 – The calculation of cumulative marginal effect

We estimate the cumulative impact of the interest variables using Autoregressive Distribution Lag or ADL(2,2) model. This approach does not consider the feedback impact of endogenous or predetermined variables because the estimation of the whole system is complicated (Kiviet, 2020). We use x_i to represent hiring and firing regulation (hf) or its squared term (hf^2) or its interaction with GDP per capita (hflgdp). For simplicity, we do not pool hf^2 and hflgdp in one equation.

Let's consider a simple specification below with $x_i$represents hiring and firing regulation:

$$fdi_{i,t} = \emptyset_1 fdi_{i,t-1} + \emptyset_2 fdi_{i,t-2} + \beta_0 x_{i,t} + \beta_1 x_{i,t-1} + \beta_2 x_{i,t-2} + \varepsilon_{i,t} \quad (1)$$

At time t, the marginal effect of hiring and firing regulation (HFR) on FDI is

$$\frac{\partial fdi_{i,t}}{\partial x_{i,t}} = \beta_0 \quad (2)$$

At time t+1, the equation becomes:

$$fdi_{i,t+1} = \emptyset_1 [fdi_{i,t}] + \emptyset_2 fdi_{i,t-1} + \beta_0 x_{i,t+1} + \beta_1 x_{i,t} + \beta_2 x_{i,t-1} + \varepsilon_{i,t+1} \quad (3)$$

Substituting (1) into (3) yields equation (4)

$$\begin{aligned} & fdi_{i,t+1} \quad (4) \\ & = \emptyset_1 \left[\emptyset_1 fdi_{i,t-1} + \emptyset_2 fdi_{i,t-2} + \beta_0 x_{i,t} + \beta_1 x_{i,t-1} + \beta_2 x_{i,t-2} + \varepsilon_{i,t}\right] \\ & + \emptyset_2 fdi_{i,t-1} + \beta_0 x_{i,t+1} + \beta_1 x_{i,t} + \beta_2 x_{i,t-1} + \varepsilon_{i,t+1} \end{aligned}$$

So, the dynamic marginal effect of HFR on FDI at one lag is:

$$\frac{\partial fdi_{i,t+1}}{\partial x_{i,t}} = \emptyset_1 \beta_0 + \beta_1 \quad (5)$$

At time t+2, the equation becomes:

$$fdi_{i,t+2} = \emptyset_1 \{fdi_{i,t+1}\} + \emptyset_2 [fdi_{i,t}] + \beta_0 x_{i,t+2} + \beta_1 x_{i,t+1} + \beta_2 x_{i,t} + \varepsilon_{i,t+2} \quad (6)$$

Substituting (4) and (1) into (6) yields equation (7)

$$\begin{aligned} & fdi_{i,t+2} \quad (7) \\ & = \emptyset_1 \{\emptyset_1 \left[\emptyset_1 fdi_{i,t-1} + \emptyset_2 fdi_{i,t-2} + \beta_0 x_{i,t} + \beta_1 x_{i,t-1} + \beta_2 x_{i,t-2} + \varepsilon_{i,t}\right] \\ & + \emptyset_2 fdi_{i,t-1} + \beta_0 x_{i,t+1} + \beta_1 x_{i,t} + \beta_2 x_{i,t-1} + \varepsilon_{i,t+1}\} + \emptyset_2 [\emptyset_1 fdi_{i,t-1} \\ & + \emptyset_2 fdi_{i,t-2} + \beta_0 x_{i,t} + \beta_1 x_{i,t-1} + \beta_2 x_{i,t-2} + \varepsilon_{i,t}] + \beta_0 x_{i,t+2} + \beta_1 x_{i,t+1} + \beta_2 x_{i,t} \\ & + \varepsilon_{t+2} \end{aligned}$$

So, the dynamic marginal effect of HFR on FDI at 2 lag is:

$$\frac{\partial fdi_{t+2}}{\partial x_t} = \emptyset_1^2 \beta_0 + \emptyset_1 \beta_1 + \emptyset_2 \beta_0 + \beta_2 \quad (8)$$

With the assumption that the impact of HFR increases/decreases the stock of FDI permanently, the cumulative impact of hiring and firing regulation after t+2 will be the summation of the impact at time t, t+1, and t+2 or equal to (2) + (5) + (8).

To calculate the impact of the interaction terms hf^2 $(hf * hf)$ and $hflgdp$ $(hf * lgdp)$, we include additional assumption that the impact of hiring and firing regulation is constant at $\overline{hf}$and $\overline{lgdp}$. So, the impact of hf^2 is equal to the impact of hf multiplied by $\overline{hf}$. Similarly, the impact of $hflgdp$ is equal to that of hf multiplied by $\overline{lgdp}$. The table below summarizes the dynamic marginal effects of hf, hf^2, and $hflgdp$ at time t, t+1, and t+2.

	hf	hf^2	hflgdp
T	β_0	$\beta_0.\overline{hf}$	$\beta_0.\overline{lgdp}$
T+1	$\emptyset_1\beta_0 + \beta_1$	$(\emptyset_1\beta_0 + \beta_1).\overline{hf}$	$(\emptyset_1\beta_0 + \beta_1).\overline{lgdp}$

Appendix 9. The difference in Hansen p-value of each level instruments

	Alternative models								
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Lagged FDI	0.06	0.38	0.16	0.07	0.14	0.05	0.77	0.88	0.27
Hiring & firing regulation (HFR)	0.03	0.22	0.18	0.21	0.41	0.66	0.33	0.57	0.09
Squared HFR	0.03	0.19	0.20	0.22	0.89	0.91	0.54	0.48	0.07
GDP per capita	0.10	0.05	0.53	0.29	0.03	0.19	0.12	0.02	0.20
HFR * GDP per capita	0.04	0.34	0.24	0.25	0.43	0.81	0.32	0.67	0.10
Squared GDP per capita[*)]	0.10	0.07	0.39	0.24	0.03	0.23	0.10	0.03	0.16
Trade openness		0.06							
Labour force			0.75						
Working age				0.32					
Years of schooling					0.38				
Corporate tax						0.29			
Natural resources							0.85		
IRR								0.36	
Financial market depth									0.75